A CHILTON PUBLICATION

The Iron Age

THE NATIONAL METALWORKING WEEKLY

JULY 3, 1952

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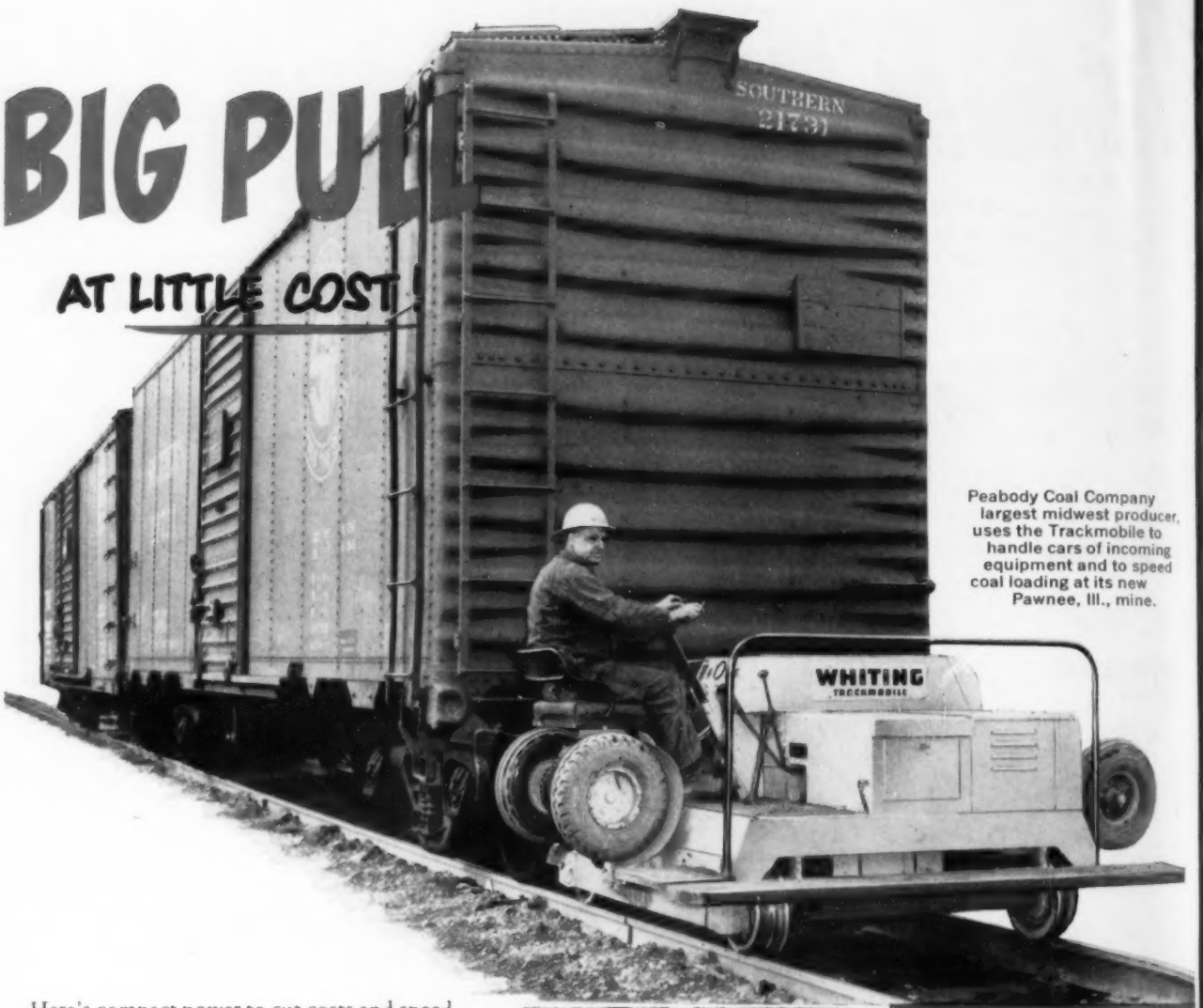
BIG PULL

AT LITTLE COST!



Peabody Coal Company largest midwest producer, uses the Trackmobile to handle cars of incoming equipment and to speed coal loading at its new Pawnee, Ill., mine.

Here's compact power to cut costs and speed the hauling, spotting and switching of railway cars! The Trackmobile's road or track operation saves time and manpower for refineries, mines, grain elevators and industrial plants of many types. It simplifies the big job of railway car handling with a low cost investment that has already proved profitable for hundreds of firms. Write today for complete reports of Trackmobile operation at leading companies!

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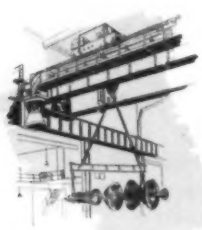
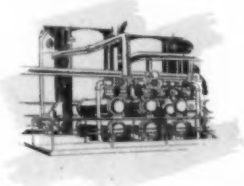
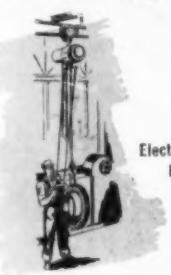


Overhead Cranes



Swenson Equipment for the Chemical Process Industries



Electric Chain Hoists

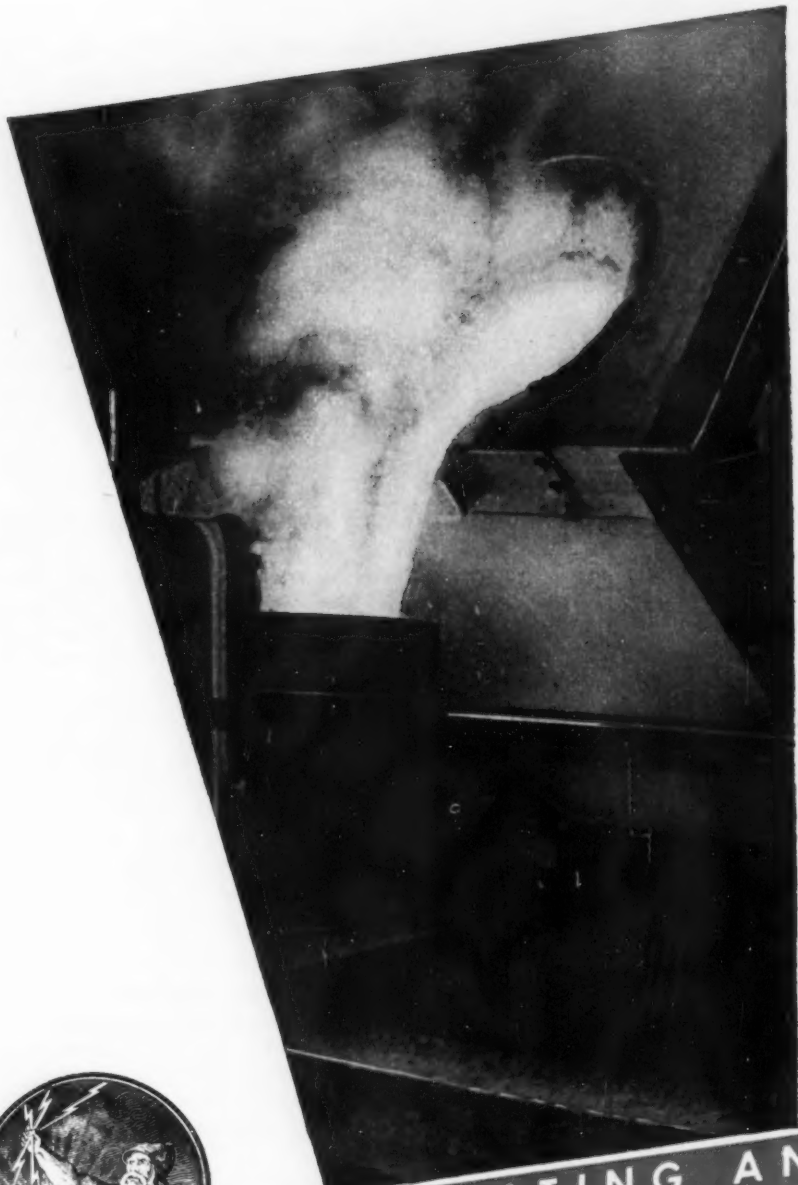
DIGEST

of the week in metalworking

Alloy savings

PAY FOR AJAX-NORTHRUP FURNACES

in three years



Induction melting saves tons of ferrochrome a month in one east coast stainless steel foundry . . . metal that was previously "burned up" in other electric furnaces.

With a three shift monthly melting capacity of 1,000,000 pounds, a 2% reduction in chromium losses made the difference. Dollar savings up to $60,000 a year are enough to pay for the equipment in a year and a half—three years on a reduced schedule.

This is only the beginning—savings in other critical and expensive alloys are also appreciable. Here are typical metal recovery figures from another Ajax-Northrup foundry melting 18-8 stainless:

Ni:	100%	Cr:	99%	Mn:	90%
Si:	94%	Mo:	95%	Cb:	92%

Besides saving metals, Ajax-Northrup furnaces melt at high speed, with extremely close control of analysis and temperature. A typical foundry, with never more than one 600-pound furnace in operation on a two shift basis, pours almost 250,000 pounds of high-melting point alloys a month. Pouring temperatures are controlled within 20°F, composition of every element within 0.25%.

Performance like this can save critical alloys for you, too. Whether you melt 8 ounces of platinum, or 8 tons of steel, write us today.

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140

FOR HEATING AND MELTING

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AJAX PARK
TRENTON 5, NEW JERSEY

The Iron Age
FOUNDED 1855

The Danger Is Still There

THERE is an old physics law we learned in high school—recency and frequency. It is a good one to use if we want to put across our ideas or to keep up with the times and trends.

For more than a year now we have had guns and butter. It looks like we have made more butter than guns. We have been able to outdo ourselves in refrigerators, stoves, radios, hot water tanks, garbage cans, television and new ice cream flavors.

We are even rich enough to afford all kinds of strikes. The baseball parks are filled; the vacation season promises a new top in spending. We have gone a long way toward making what used to be a luxury a must.

All this is well and good. It proves what we can do with our mass producing techniques. But are we getting so smug that we are forgetting what is going on outside our yard? Is ours only a half-response to real danger?

The man on the street could have told you long ago that the peace talks in Korea were a trap. He could have told you the Communists would use them as a propaganda board and for a buildup of their force.

Even the State Dept. knows that today. Just where we will come out is vague. Apparently we judge what the Communists would do by what we would do—which is a million miles from the truth.

Then we have no air force to match Red China and Russia. Both these countries were grimly earnest in arming while we had guns and butter. We appropriated enough to get the guns but bungling and "it can't be done" tactics have done us wrong. It is true that the armed forces have to keep things from becoming obsolete—which means all kinds of changes in production.

It is true, too, that manufacturers and contractors have spent vast sums on dies and methods. They were led to expect orders which would pay for this outlay. Many of them have never seen the orders —or the orders have been too small to warrant a good economical production schedule.

There is something wrong somewhere and it isn't with industry. Russia must be laughing her head off—as are the Red Chinese.

It may be that we have forgotten that Communists bide their time, know no truth, are ruthless, expect to win eventually and will fight if absolutely necessary. We have much to learn about them and little time to learn it. The danger is as great now as it was when in our enthusiasm we embarked on the stalled defense program.

Tom Campbell

Editor

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Dear Editor:

Letters from readers

Personal Opinion

Sir:

I'd just like to tell you that, as an individual, I am in hearty accord with your editorials in THE IRON AGE.

Further, I'm telling all my people.

JACK SINGLETON
Chief Engineer

American Institute of Steel Construction, Inc.
New York

Still Hot

Sir:

We wish to obtain additional information concerning the "Ultrasonic Soldering Iron," which appeared in an article in the March 27 IRON AGE, "Ultrasonics Make Soldering Easier." If the soldering iron is being manufactured or distributed in the U. S., please tell us by whom.

A. F. TOELKE
Mechanical Engineer

Bussmann Mfg. Co.
St. Louis, Mo.

The iron can be secured from the International Electronic Corp., 137 Hudson St., New York 13, N. Y.—Ed.

Splendid

Sir:

We have just finished reading your splendid article in the June 12th issue of THE IRON AGE—"Complex Parts Easily Coated With Aluminum."

Could you please tell us if this process can be used for dip coating aluminum onto nonferrous metals such as bronze castings?

Your article was very well written. It seems that the process should have many valuable applications. The research men at General Motors should certainly be commended.

W. W. OLIVE

James R. Kearney Corp.
St. Louis, Mo.

Sorry to say that GM Research has "nothing to report" on aluminum coatings for nonferrous castings.—Ed.

Misplaced Bridge

Sir:

It happens in the best of families, occasionally, I know. . . .

There's something wrong with this Joliet skyline. The bridge *is* relatively near to Joliet, but my guess would be that it's the Dearborn Street bridge in Joliet's largest suburb, looking north, with Wacker Drive at bottom right across from the backdoor of the Wrigley Building, and the Palmolive Building towering to the north on Michigan Avenue (top, center.)

Right?

One wonders how many others may note the discrepancies in geography. At least it lets you know that here's one more subscriber who really reads the book.

JACK O. FELT

You are right about the bridge. The misplaced caption was caused by a provincial Easterner who wrote the caption for the photo service.—Ed.

Out of the Lab

Sir:

In the June 19th issue of THE IRON AGE under "Forecast" there is an article regarding ultrasonic cleaning.

It is our understanding that ultrasonic operations are still in the laboratory stage. Can you give us more information concerning the applications mentioned in your article?

P. W. SOUDER
Vice President

Campbell Soup Co.
Camden, N. J.

You're correct in assuming that some ultrasonic cleaning work is still in the laboratory stage. The glass cleaning operation mentioned in the "Newsfront" is still in that state; so is the possibility of ultrasonic steel strip cleaning. But some smaller applications are well into the commercial stage; they cover quite a range of products from ball bearings to electric shavers. We are planning on an article on this subject.—Ed.

Q-5923A

Sir:

Will you please send to the attention of Albert Polk six copies of your information on new quality control specs for Air Force contractors (MII-Q-5923A), found in your May 8th issue.

VIRGINIA C. FORD

The Sheffield Corp.
Dayton, Ohio

Design for Sinter

Sir:

We would appreciate receiving 12 reprints of the article appearing in June 5th issue, "Sinter Production Tied to Plant Design" by Martin L. Cover.

Also we note at the end of article mention of "Statements made relative to these percentages are based upon the discussions of Swedish sintering practice—*AIME 1950 proceedings.*" Is it possible to get these above mentioned proceedings?

JOSEPH H. JORDAN

U. S. Steel
Duluth, Minn.

We should have spelled that out. AIME's address is: American Institute of Mining & Metallurgical Engineers, 29 W. 39th St., New York 18, N. Y.—Ed.

Fatigue Cracks

by Charles T. Post

Fish Story

An editor's job, like most, is largely sweat and toil, but there are certain happy aspects. For one thing, the editors of your f.f.j. travel most of the Western Hemisphere, from the wilds of northern Canada to the cities of Brazil. Too, nearly every industrial firm these days has a public relations man who feels that closer rapport with the press is nurtured by elaborate steak luncheons, junkets of one sort or another, and an occasional bottle of Scotch.

The ultimate came last week when Bob Hatschek, whose special province is articles on non-ferrous metals, received two cans of sardines along with this letter from Aluminum Import Corp.: "We have received from our associates in Oslo, Norway, Nordisk Aluminium-industri, a shipment of alu-packed Norwegian brisling sardines in olive oil with printed foil labels. . . . Since this is an interesting application of aluminum in Norway, we thought you might also like to see a couple of these cans and taste their contents. Nordisk has told us that there is now a definite demand in the United States market for this can for kipper snacks and for sild and brisling sardines packed in it also. The cost in Norway of the finished can compares well with that for cans made from tinplate."

Aptronyms

Some loyal reader with du Pont has unearthed the intelligence that Mr. D. Echo is associated with Allen B. Dumont Laboratories, the radio-TV firm. And the editorial department has passed the word that J. H. Lines is general industrial agent for the Atlantic Coast Line.

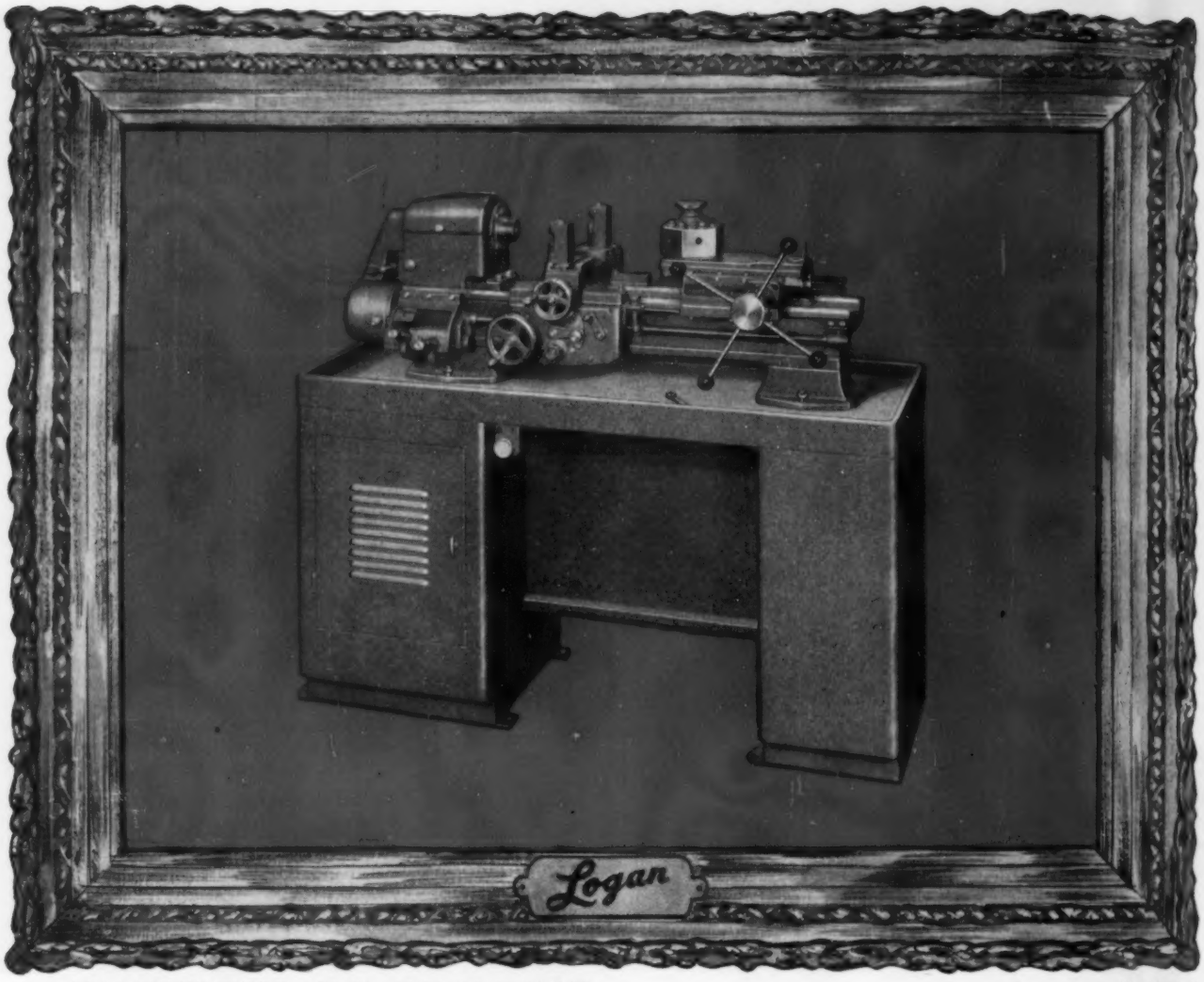
Puzzlers

The solution to last week's puzzler was easier than it looked. It took the horses 2 hours to get together so the bee flew 20 miles. R. T. Wakefield and R. D. Hutchison, Piper Engr. Co., were the first to solve this one.

Even the Puzzler section of Fatigue Cracks feels the effects of the steel strike. With no steel everyone seems to have time to solve the puzzles. So far we have heard from the following on the long division problem: R. W. Shank, International Harvester Co.; W. A. Makely, Ravena Iron Co.; H. R. Maier, Ideal Wrapping Co.; A. M. Todd, Brunhoff Mfg. Co.; L. D. Rice, Timken Roller Bearing Co.; L. E. Cooper, American Steel Suppliers Inc.; H. K. Fried, British American & Eastern Co. Inc.; R. D. Hutchison & R. T. Wakefield, Piper Engineering Co.; B. B. Hood, Falls Church, Va.; J. Knapp, San-Equip Inc.; H. B. Fabens, National Safe-Line Clamp Corp.; C. E. Norton, Chicago; W. A. Sawdy, MacInnes Steel Sales Co.; J. L. Eisendrath, Jr., Banthrico Industries Inc.; P. Pozzi & G. H. Jessica, American Flange & Mfg. Co., Inc.; A. T. Holman, The Dow Furnace Co.; C. Herrnkind, Grumman Aircraft Engineering Corp.; A. G. McClelland, Runnymede Iron & Steel Ltd.; I. J. Chamberlain, Western Electric Co., Inc.; R. C. Salimbene, Columbus, Ohio; S. S. Maremont, Maremont Automotive Products, Inc.; E. T. Brace, R. D. Werner Co.; R. W. Huff, Canton, Ohio; J. J. Manderscheid, Jr., The Manderscheid Co.; N. Holcomb and W. E. White, Morse Twist Drill & Machine Co.; C. M. Cobb, Jones & Laughlin Steel Corp.; A. Stragnadine, Bingham-Herham Corp.; M. Findlay, Harris Foundry & Machine Co.; M. Sesskin, Litecraft Mfg. Corp.; T. Emaus & F. Cook, Grand Rapids Metal Craft.

Some late-comers on the homogenous bar problem are B. Uljee, Medart Co.; L. D. Rice, Timken Roller Bearing Co. and V. O. Sturtevant, International Business Machine Co. J. Povalski, Edward Purvis & Son, has solved the concentric circle puzzle; G. H. Reid, Carbide & Carbon Chemicals Co., has some novel solutions to the Gardener problem and R. W. Payne, Columbia-Geneva Steel Co., has come up with answers to the Gardener problem and the concentric circle puzzle.

We've had a number of requests lately to repeat the cow puzzler that appeared here over a year ago, so here goes. A farmer has a cow which he tethers to the end of a rope 110 ft long. The rope is attached to a corner of the barn which is rectangular and measures 40 ft by 60 ft. Disregarding the thickness of the rope and considering 110 ft as the extreme distance the cow can reach, what is the total grazing area around the barn?



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11″ Swing Quick Change Gear
Turret Lathe, 1″ Collet Capacity,
1⅜″ Spindle Hole, 43½″ Bed

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By holding the costs as well as the tolerances, Logan Lathes put new profits in metalworking production. Today's 11″ swing Logan Lathe, with its 1″ collet capacity and 1⅜″ spindle hole, brings the accuracy and efficiency of Logan advanced design into wider, more profitable use, than ever before.

The versatile Logan is easily, quickly set up for accurate performance on every type of lathe turning operation. Its ball bearing spindle mounting has the sustained accuracy at high speeds to hold precision tolerances. Spindle runout twelve inches from the bearing is within .0005″. The two V-ways and two flat ways of the rugged, balanced bed are precision ground to a tolerance of .0005″, and are warp-free. Construction throughout is rugged. Self-lubricating bronze bearings protect vital points against wear. No other lathe of comparable specifications and features can match the Logan in economy. That is why the Logan Lathe stands out in performance and *profitable* operation on production lines, in tool rooms and shops.

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LOOK TO LOGAN FOR BETTER LATHES AND SHAPERS

LOGAN ENGINEERING CO.

4901 West Lawrence Avenue, Chicago 30, Illinois

The Iron Age
FOUNDED 1855

THE IRON AGE Newsfront

► The first trial runs on continuous casting of a ½-in. thick magnesium slab were made last week on a casting machine employing a moving mold. A steel company has ordered a similar type casting machine which will be designed to continuously cast 10-gage steel strip. And a large brass mill has ordered a similar machine.

► Electrolytic manganese can be used in place of copper to make a product quite similar in properties to ordinary brass and bronze. The manganese must be exceptionally pure for best results and cost is high.

► Lawn mower blades are being austempered in a salt bath in lots of 55 blades at a rate of 600 per hr. No quenching fixture is used; the blades hold their shape while hardening to 48 to 52 Rc. The hardened, relatively stress-free blades hold their shape in service.

► Stretchout of the defense program is drastically cutting back-logs of machine tool rebuilders, some of whom will be out of government orders before September. After that, few federal rebuilding orders are in sight.

► Great gains in use of radioactive tracers in private industry are likely to run into a temporary manpower shortage. Personnel trained in handling isotopes are already in high demand. But basic training is not too difficult and AEC operates a more elaborate training course.

► Some 600 lb of weight are saved in the "Flying Boxcar" (C-119H) by use of Ryan-built fuel tanks suspended from the wings to carry all the ship's fuel. Saving comes from elimination of cells, fittings, etc. Maintenance and fire hazards are reduced.

► From now on almost all delays in the defense program will be categorically blamed on the steel strike. But the fact is that several important and basic defense programs were behind schedule when the strike hit — even though the necessary steel for them was piling up unused.

Strike costs will cut national income and tax yield estimates because of its effect on the steel industry, its customers and labor. Steel labor alone is losing $7.5 million a day. Costs to companies can't yet be calculated.

► A Mn-Ti alloy, containing 7 pct manganese, balance titanium, will soon be tested for armor plate use. Lighter weight is, of course, the object.

► So far this year, the number of cancellations of machine tool orders has been equal to more than a third of the new orders received. Some builders feel that this is not so much an indication of falling demand as it is a sign of confusion in Washington as to how much of what is going to be built by whom, and when.

► Although coal producers are optimistic about long range prospects, best guess is that coal demand will not keep pace with the average increased use of other minerals. They see a declining market for the next 2 or 3 years, followed by a slow climb to a new plateau about half again as high as it is now.

► A new spray gun which applies heat to the nozzle saves paint and is said to produce thick coatings without danger of orange peel or cracking. Standard type spray guns are adapted with a hot air line that heats the paint to 140° F.

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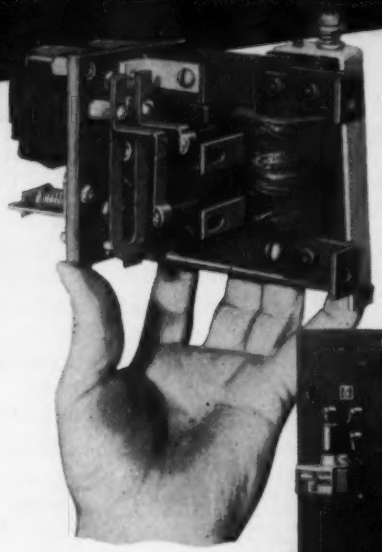
set at 90% to 110% full load current



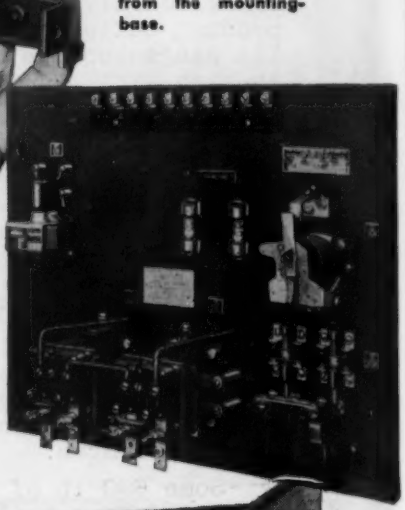
¾ rear view shows independent thermal and magnetic tripping elements — both are adjustable. Relay is front-connected, removable as a unit from the mounting-base.

In a certain chemical processing cycle motor-drives operate up to six months without stopping. Continuous operation is essential until the product is completely processed and the machines cleared. Ambient temperatures are high.

To safeguard the insulation of these motors—by keeping temperature rise within safe limits—EC&M 2300 volt Motor Starters with EC&M NEW Type ZTM THERMAL-MAGNETIC Overload Relays were chosen.

These new Relays couple motor current directly to thermal action through a transformer for quick, positive response. Depending upon the motor load and ambient temperature, the thermal element of these Relays is adjusted from 90 to 110% Full Load Motor Current. Thermal reset time is short. Magnetic instantaneous operation minimizes damage under fault current conditions.

For improved motor protection, investigate EC&M THERMAL-MAGNETIC Overload Relays.



Type ZTM Overload Relay Panel with Time-Delay Under Voltage Protection feature is mounted in the lower compartment of EC&M 2300 volt Full Voltage Starters.

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WARPLANES: How Reds 'Won' Air Race

Air power race was lost when Washington surrendered, waved olive branch . . . Should have hit May schedule year ago . . . Machine planning tragedy of errors—*By W. V. Packard.*

Don't be lulled into a false sense of security by the announcement that our warplane production was right on schedule (800 planes) during May). We should have reached that level of output at least a year sooner.

The facts are that Russia can put more combat planes into the air than we can. In vital jets her numerical advantage is lopsided. Even if our factories are able to produce on schedule—the reduced one—our production pace won't match the Reds until 1953. And it will probably take 2 more years before we catch up to their total air strength—on paper.

Washington Surrenders—Russia has not won air supremacy. We have surrendered it. No matter what you hear, industry is not to blame. The surrender was made in Washington.

Since 1946 Russia has been spending more money, conducting more research and building more planes by far than we have.

While the Reds were feverishly building, we were even more rapidly curtailing. Responsible Washington officials were walking around carrying an olive branch when they should have been carrying a cannon. Our aircraft production fell from 96,318 in 1944 to a measly one-fiftieth of that amount in 1946 and 1947.

Looking at it even more realistically, our air force shrank from 218 groups on VJ-day to a paper strength of only 52 groups in 1946. Worse still, of these 52 groups only two could be considered operationally effective. That was the low point.

Different Story?—Had the Politburo decided to commit large numbers of modern planes in the early days of Korea the story would have been much different. Our own air strength was stretched paper thin by this war and by the need to maintain defense elsewhere.

Immediately upon the outbreak of fighting in Korea the Air Force reappraised the need. A new program calling for maximum speed-up of aircraft production was worked out and approved. The program was thought to be realistic. It was based on the assumption that the Air Force would get priority on aircraft equipment, machine tools and materials.

This program is the one that was later declared unrealistic—after we had fallen far behind. By that time it was unrealistic—and the main reason was that the steps necessary to assure machine tools were not taken until a year later.

Save by Industry—It was not until Charles Wilson was placed in charge of Office of Defense Mobilization that the green light was finally given the machine tool industry. It is not unfair to say that a year was practically lost on both the tool program and the plane program.

The appointment of men like Harold Boyer, Clay Bedford and Swan Bergstrom, and the work they did, more than anything else helped bring order out of chaos. By that time the aircraft program was indeed unrealistic, and a reduced schedule had to be adopted. Budget cuts trimmed it still more.

Those in charge of the defense program in the early days showed little conception of what it takes to build modern jets. They expected them to be built with mothballed tools left over from World War II. They refused to grant incentives (such as higher price allowance for subcontracting costs) which would have meant more rapid expansion

of the then depressed tool industry

It is noteworthy that those who helped plan the original aircraft program still believe it could have been met if the proper incentives had been given the machine tool industry in the first year after Korea. It took a year for Washington to find out what men in industry already knew: (1) That World War II tools couldn't build the jets we wanted, and (2) the machine tool industry had to be given the green light to expand its production by the desired amount.

Over the Hump—Those close to the production end of the aircraft industry insist that there will be a shortage of tools until the last one has been delivered. This is borne out by experience during the last war. But, unless the program is to be increased, we are past the worst part of the shortage now.

Plane production is scheduled at the rate of 10,000 planes a year for the rest of this year. In 1953 it should reach 15,000. Production has increased more than 50 pct in the last 6 months—but it could have come sooner.

The revised goal now is 143 groups by 1955. But is it enough? And will it be reached soon enough? Information supplying the answers has not been made public.

Loss of time in getting plane and tool programs straightened out is even more important when you consider the lead time between drawing board and plane production. On a modern jet lead time from first design to flight test is about 5 years.

Then you must add 2 years to get it into volume production. On a bomber it takes at least a year longer. First models of the jets in Korea today were ordered toward the end of World War II.

Heavy Presses—The Air Force heavy press program has finally jelled (THE IRON AGE, Apr. 3, p. 85). This program will eventually help assure our production leadership. It will cost about half a billion dollars, and will probably be completed in 1954 or 1955.

But the Russians got the jump on us in this important field, too. In 1949 they completed dismantling and withdrawal of a number of German heavy presses. They are now being used to produce Red jets.

If the Munitions Board had backed the heavy press program when it was first advocated several years ago, the task of boosting plane production after Korea would have been not nearly so tough. These presses could have done much of the work that had to wait for building of tools.

Perhaps this should be the No. 1 program—to be pushed above all others. Some men from industry who have been close to the defense program in Washington think it is.

Quality or Quantity—From the begining the planners have been confronted with this dilemma: Should we freeze plane design and shoot for maximum output, or should we change designs as new improvements are worked out?

So far the program has been a compromise. Production has been boosted, but some has been sacrificed to design changes.

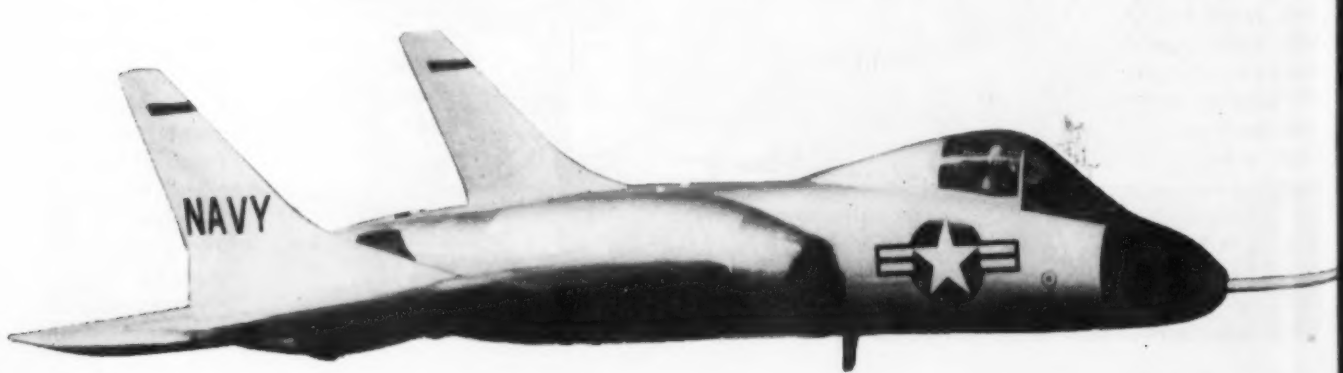
Those who advocate building tools and productive capacity say that building planes for defense is like buying an insurance policy. If you don't die and collect the premium, you have thrown the money down the drain, so if you don't have all-out war big plane production would be money down the drain as soon as the planes are obsolete. The tools and productive capacity would be there if needed.

An early criticism of our jet program was that it called for more of some types of scarce alloys than there are available in the free world. A continuing program of research and conservation has scaled the demands down to the point where, though still high, they are at least realistic.

Jet Bottleneck—The jet engine has really been the bottleneck in the whole program. Though simple in theory it is as complicated in machining as it is in metallurgy. It requires many types of huge, special purpose machines. On some jet jobs standard tools can't do the job at all; on others they can be substituted at the expense of speed and efficiency. Some believe changes in jets are coming too fast to make full tool-up practical.

Bitter experience with this tremendous tooling job has raised the question as to whether we shouldn't have a continuing study of defense requirements—in war and peace. The ignorance of some men who should have known what was needed after Korea is appalling.

Despite mistakes at home, Air Force pilots have given a fine account of themselves in Korea. Military men believe our 8 to 1 combat ratio results from (1) Better training, flying and gunnery of our pilots, (2) bold and efficient tactical use of our limited air strength, and (3) disinclination of the Reds to fully commit their bulging 1700-plane force across the Yalu River.



STEEL: It's All or Nothing Now

Compromise on union shop issue out . . . One side must give in . . . Union offer called compulsory unionism slightly disguised . . . Worker pay loss averages $388—*By J. B. Delaney.*

Final settlement of the steel dispute calls for the surrender by one side or the other on the union shop. There is no room for compromise. The reason is simple. No matter what face-saving formula might be agreed upon, someone would lose. There couldn't be two winners.

Plan discussed by the United Steel Workers and industry leaders at the New York meeting on June 20 is a case in point. The union was ready to settle. But a majority of the six largest producers wouldn't buy the the union proposal. They said it was still compulsory unionism, slightly disguised.

Registered Resignation—Formula was this: New employees must sign an application for membership in the union and at the same time authorize deduction of union dues and initiation fees. After 20 days of employment the worker would be able to resign from the union by sending registered letters to union, company. If he did not act before 30 days he remained a member.

From a union standpoint this would be a good deal, because few workers could be expected to take the trouble to quit the union once in. So the chances are that under such a plan 99 out of 100—or more—of new employees would continue their membership in the union. Present non-member employees would not have to join. But this would be no union concession since there are union shop contracts that include this provision.

No Bows Taken—It was not clear who made this proposal. One report was that the plan was initiated by the union and presented to the producers through Bethlehem Steel Corp. Another version—this from the union side—is that the approach came from Bethlehem.

Over last week end the union picked off a fair-sized plum—Pittsburgh Steel Co., with 10,500 production and maintenance employees. The company agreed to the modified union shop on a permanent basis. It also agreed to 12½¢ per hr wage increase and shift differentials of 6¢ and 9¢ per hr effective Apr. 1, subject to adjustment based on final settlement with the industry generally. The union also signed McLouth Steel, Northwestern Steel & Wire, Granite City.

FOR DEFENSE: Navy Lt. Herman A. Patterson thanks James A. McLaughlin, head of USW Local 1843, for letting defense steel leave Jones & Laughlin Steel Corp.'s Pittsburgh Works. Shipment is earmarked for the U.S.S. *Randolph*.

The USW is making the most of these and other conquests as part of its divide-and-conquer tactics. It is hinting that one or more of the Big Six—U. S. Steel, Bethlehem, Republic, Jones & Laughlin, Inland, and Youngstown Sheet & Tube—will be next. This would break the solid front and probably end the industry-wide strike.

Meanwhile, pressure for an early resumption of production became almost irresistible.

The strike has hit defense and civilian industries alike. And an estimated quarter million workers in industries dependent on steel are idle. Unemployment has been growing daily and will accelerate alarmingly if the walkout is not settled this week.

Pressure on Unions—Union officials were under as much pressure as industry and government. The economic pinch on the strikers is hitting home. Based on American Iron and Steel Institute's average wage and hour figures for March, the strike by the end of this week had cost each worker around $388 in lost pay. Total pay loss for all steelworkers will reach the staggering total of about $208,471,325.

As a result, mill towns are virtually prostrate. Merchants are considering closing their doors due to inability to extend further credit.

Strikers, unable to claim unemployment compensation benefits, are flocking to relief agencies.

Double Blow—If President Truman invokes the Taft-Hartley Act to get the mills into production, the union may lose on more than one front. The law calls for a secret ballot at the end of 60 days to determine whether the strikers want to accept the industry's last offer. Apart from union shop, the industry is willing to grant a package close to that recommended by Wage Stabilization Board. There is a chance the workers would accept the industry offer and thus put pressure on the union leaders to settle. The vote is not binding.

Other developments included signing of a contract between Weirton Steel Co. and the Independent Steelworkers Union, covering 11,500 production and maintenance workers. Contract calls for the same improvements offered by the industry to the USW—A general wage increase averaging 16¢ per hr, a total cost to the company of approximately 25¢ per hr, 6 paid holidays, with double time for holidays worked, 3 weeks vacation after 15 years service, shift differentials of 6¢ and 9¢, respectively, for second and third shift work.

PRODUCTIVITY: What's It All About?

Survey shows executives mistrust it as factor in wage policy . . . Unions follow WSB hint, push it hard . . . Management not accepting labor efficiency as big factor—*By G. G. Carr.*

Productivity in industry is a lot like morale in the Army. Everybody talks about it but few are sure what it's all about.

Not a new term, its use as a factor in wage policy is relatively recent. It all started in 1950 when General Motors and United Auto Workers amended their contract. The new agreement provided an annual wage increase based on an assumed annual rise in productivity. After this, a number of other companies, most with UAW contracts, wrote in such provisions.

Union chiefs have often disagreed among themselves in the past over this issue. But Wage Stabilization Board has already "taken increased productivity into consideration" in its recommendations in the steel and Curtiss-Wright Co. cases. In neither situation had the union formally requested an annual improvement factor as part of its demands.

Approved—It now appears that labor has seized on productivity to justify further wage demands. Fisher, Rudge & Neblett, management consultants, recently completed a survey of executive opinion on this issue as a factor in wage policy. Their data show that it will be a key part of union bargaining in over half the contracts coming up for renewal in the last half of 1952. Both the CIO and AFL are on record as approving this approach.

Over 60 pct of the firms replying to FR&N's survey said the issue has already come up for management policy discussion. Of the companies with union contracts (about 88 pct), 43 pct reported their unions had already raised it in contract talks.

Management generally (56 pct) agrees with the unions that productivity is increasing. Some 63 pct believe it will continue to rise in the future. But management is opposed to using it as a wage factor.

Not Worth It—Many executives feel that wage demands based on productivity are simply a means of getting a guaranteed annual wage increase. Only 9 pct feel that use of a productivity factor would lead to greater productivity in their own companies.

Labor has implied that its contribution to increased productivity was all-important. But management thinks otherwise. Forty-six pct of the firms answering the FR&N survey ranked new plant and equipment as the major factor. Second place went to better managerial techniques, with 23 pct of the votes.

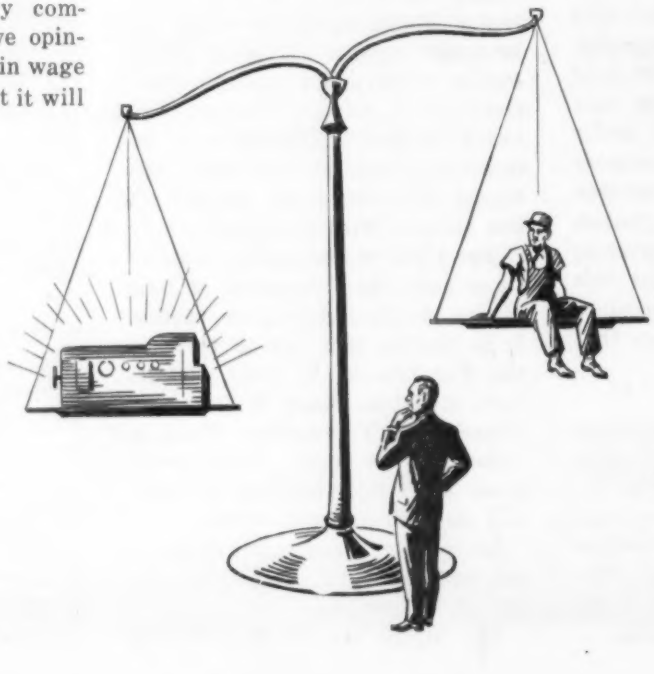
Better utilization of existing facilities, closely connected with improved management, was third. Fourth place went to research and invention. Many replies undoubtedly included this in their thinking on new equipment.

Increased labor efficiency was at the very bottom, below such marginal factors as improved marketing conditions and cyclical business expansion. In management's eyes labor is asking to share in something it had little or no part in achieving.

This does not mean that management is not interested in increasing labor efficiency. Sixty-six pct reported they were using some form of incentive, but under 5 pct felt that labor had contributed to improved productivity. FR&N comments that labor efficiency is obviously desirable for its own sake. Barring a depression, which nobody wants, the wage trend is upward. More value per labor dollar is essential.

Other Areas—But with wages on the rise increased labor efficiency cannot do much to boost productivity. Costs must be cut in other areas to lower the cost per unit and raise output volume. FR&N finds overhead and production planning particularly sensitive spots.

Executive payrolls are often swollen, they say, but point out that it's important good men be well paid. Clerical efficiency is a relatively unexplored field for cost cutting. Selling and advertising budgets are tempting targets, but the experts warn against indiscriminate slashes there.



Production planning is often noticeable by its absence, FR&N reports. Tool control is a great weakness. No worker can be very productive if he has to walk half an acre to get a tool that should have been spotted at his machine in the first place. And materials flow still doesn't get the attention it deserves in spite of all the comment it's received recently.

STEEL: Nibble at Foreign Offers

Exhausted inventories force some manufacturers to turn to Europe for supplies . . . Plate is main item . . . Inquiries cautious . . . High costs seen as a big obstacle—*By K. M. Bennett.*

With exhausted inventories forcing midwestern manufacturers to cut back production or suspend entirely, a few buyers were nibbling in a half-hearted way at foreign steel offers last week.

Brokers reported a few inquiries, mostly cautious, that led to no appreciable sales increase. First indications came at the importer-shipper level where a few new orders, chiefly plate, of 100-200 tons were reported. Warehouse firms here who had been stocking foreign steel were continuing to import the steel, but their orders for midwestern delivery had been tapering since the first of the year. Most expect to continue this trend.

Good Reasons — If midwestern consumers were still hesitant, they had a number of good reasons for their caution:

(1) Delivery dates . . . U. S. steel production potential had been rising steadily prior to the strike (THE IRON AGE, May 22, 1952), eliminating old backlogs. With foreign steel requiring up to 3 months or more lead time, it might be more convenient costwise to wait out the return of American steel to full production. One shipper is now promising 6 to 8 week delivery; figures most commonly quoted are 45-60 days. Even steel stockpiled at an overseas mill or port would require a minimum 30 days delivery time. A goodly percentage of foreign steel coming into the Great Lakes will arrive in 12.5 knot vessels of 2800-3000 ton deadweight, would require 20-25 days to cross the Atlantic and thread through the Lakes canals.

(2) Quality and size ranges . . . justifiably or not, purchasers were not positive that they would receive steel in desired formulas, or were not positive that they would receive steel that would answer exactly all of their size specifications. Some indicated a belief that a great percentage of anything they might order from abroad would be bessemer steel, not the openhearth grades they would prefer and sometimes must have.

(3) Pricing. . . . And having been burned last year by high prices (as high as $225 per ton of plate, f.o.b. Antwerp, according to one source) they were wary of the costs involved. Foreign steel prices have proved very sensitive to U. S. steel demand. As steel demand here rose last year, prices for European steel went up like an express elevator. The goal was dollars.

How Much—Last week, a metric ton (2204 lb) of carbon plates could be purchased f.o.b. Belgian mills for $190, according to Metron Shipping Corp., Chicago. To this would be added water shipping costs to Chicago, in the case of an all-water haul to that point. This would approximate $20 to $26 per ton. To this, a midwestern buyer would then add about 14 pct duty. (Rates are: 1.25¢ per lb on carbon steel plates costing 8 to 12¢ per lb, and 1.75¢ per lb on steel costing 12 to 16¢ per lb; then 12.5 pct on anything costing more than 16¢ per lb. Structurals run only about $2 per ton, however.) Broker aid in handling his customs paper work might run another $15. Add to this any importer commission, and that ton of plates becomes a strictly emergency item.

Supplies of warehoused foreign steel here in the States already seem to be somewhat low, particularly in plate. One supplier quoted $180 per ton for 0.5 in. plate to be delivered in 60 days; would supply smaller sizes in 7-10 days at the same price.

But with foreign steel mill prices beginning to perk up, and the shrinking store of warehoused foreign steel that was brought in during the low price period that began in the first quarter of this year, it appears that foreign steel will still be a profit-cutter.

PILED UP: Iron ore shipments were moved to sidings in the Philadelphia area last week as struck mills refused shipments. Some fabricators, desperate for steel, were reported dickering cautiously with importers of foreign steel.

ELECTRONS: New Role for War Baby?

In peace electronic error-sensors, process controls will be part of progress to automation . . . War has matured science . . . Education job looms . . . Role of computers—*By T. Metaxas.*

Hitched to war's wagon, electronics has been pulling effortlessly. Without it, human reflexes, senses, and thinking speed would be pathetically inadequate to cope with new conditions of war. And the design engineer would labor tediously and incompletely at mathematics.

The electronic tube, reacting as fast as light, is causing profound stirrings in communications and television. A sprinting progress has been lent to accounting, production planning, research by electronic calculators. But in manufacturing electronics is not yet such a potent force.

It has introduced sensational devices into industry for research and testing of products. But progress has really just begun. The abilities of the electron tube and transistor to amplify and control flow of electricity, receive and transmit impulses, and substitute in lightning-swift fashion for the human senses of sight, touch, feel, hearing will make electronics an integral part of the larger industrial movement to automation.

Look—No Hands — Electronics will serve in the development of servomechanisms (robot machinery, if you like) which sense their own errors, measure them, and then correct power or raw material input to regain balance.

The energetic and imaginative people now making military electronic equipment and servomechanisms can be expected to become serious contenders in automation. They are keyed up to the need for a permanent market in industry. Nurtured by war contracts, electronics has been beefed up to the point where it cannot coast along when military spending abates.

Working for industry, electronics can yield more automation, more productivity, stricter quality control, more self-governing, self-correcting processes. But the wizardry of this science will not revolutionize production tomorrow.

The major problem of educating the plant owner to its benefits or divining his needs must first be confronted. Secondly, technology in many manufacturing steps has been moving to mechanical perfection — without electronics. And there are other methods of detecting deviations in output—electrical, mechanical, nuclear. But electronic controls can still adjust motor speed or input when other error-sensing devices track down variations—and vice-versa.

Another obstacle to the employment of electronics is that some processes are too elementary or too crude to benefit.

Atom, Electronics Team Up

Nuclear sensing equipment and electronic controls are being used by Gates Rubber Co., Denver, to detect errors and adjust machinery so that uniform coatings on tire and belts can be assured. The equipment was tailored for Gates by Industrial Nucleonics Corp., Columbus.

Actual sensing of deviation from the correct standard of rubber coating is accomplished by a tiny radioactive particle of Strontium 90, an atomic by-product. Beta ray beams continuously measure amount of rubber coating going on fabric and indicate measurement on recorder charts. When the indicator approaches tolerance limits of either too much or too little rubber, electronic controls are actuated to adjust the calendering machine.

Window Shopping—Arma Corp., of Brooklyn, a producer of military electronic devices, has very few spare minutes to devote to civilian industry. Yet it is scouting to enter this field in the not-to-distant future. Arma told THE IRON AGE that many of the electronics and servomechanism principles developed for war can with ease be translated into peacetime equivalents.

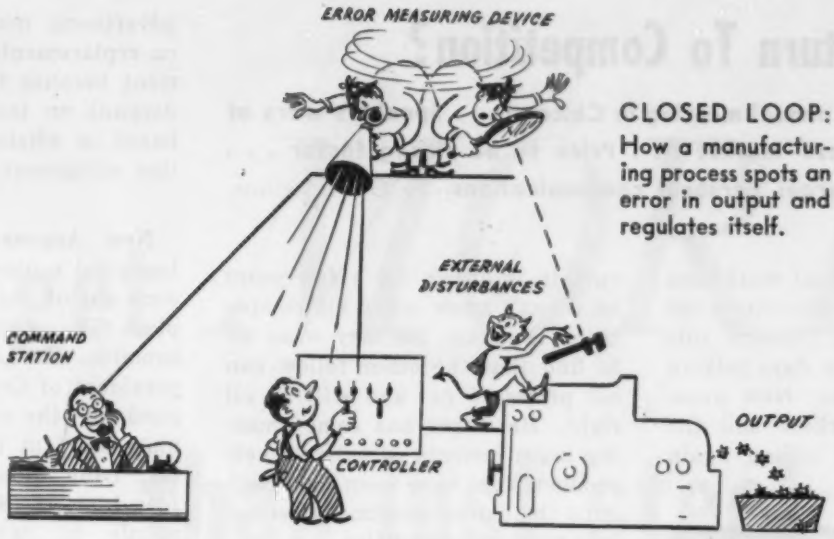
In many cases the task will be child's play because more stable manufacturing will not be bedeviled by the violent variables of war (pitching of ship or tank while the computer gathers range information to train the gun, elusive targets, vastly varying conditions of weather, etc.)

Computing problems for manufacturing, excepting research, will be much simplified. Military electronic devices must be as small as humanly possible. This has led to miniaturization of parts and compression. Fortunately, industry generally has no need for items so tiny. Costs can be cut, maintenance simplified.

Two-Stage Debut — Electronics people point out that government money has matured their industry. Manufacturing will not have to sponsor a fledgling science at enormous expense. Chemical and petroleum industries have already put out the welcome mat for electronics and have kept dusting it off. Here can be found almost completely automatic plants. Liquids lend themselves well to the discipline of electronic devices.

Jules Kaplan, head of Arma's servomechanism department, told THE IRON AGE that automation and electronics will ease into manufacturing in two stages. First, present machinery will benefit from electronic patchwork. Both product and process will remain fundamentally the same.

But the true era will be ushered in when products and machinery are redesigned to fit them for automation and electronics.



CLOSED LOOP: How a manufacturing process spots an error in output and regulates itself.

Brain Blocks — Arma is now building at Roosevelt Field, Long Island, a research lab and a plant for mass production of "brain blocks." These standardized, interchangeable brain blocks are precision electrical rotating mechanisms such as resolvers, synchros, induction potentiometers, differentials, servomechanism, tachometer generators. These are the muscles for automatic controls. Arma is striving for wider use through less cost. Others are following suit.

An example of how electronics can be applied in manufacturing is the closed loop system (feedback) whereby manufacturing regulates itself by detecting and correcting deviations from the standard. This system spots errors at the point of output through a finder that can be electronic, electrical, or mechanical.

Right Track—Measuring the error, the finder relays the information to the actuator which again may be electronic, electrical (motor), or mechanical. Balance is then restored. Here, continuous "scanning" of output, discovering errors, rectifying them is the guts of automation. It makes it work.

Arma's Dr. Fred W. Cunningham has outfitted a Fellows gear cutter to make non-circular gears electronically. Digital specifications of the gear are imprinted on a strip of movie film, which relays the impulses to a bank of photoelectric cells. Machine and brain blocks then perform the work.

Laborious and expensive steps of custom cutting a set of master gears for later duplication are bypassed.

Auto Automation—One electronics expert told THE IRON AGE that perhaps automakers could find great opportunity in electronically controlled machines. In Detroit model changes and retooling involve huge expense. It may now be possible to build an electronically guided machine that will take its instructions from film or tape and produce models and dies automatically.

Teamed with this machine would be digital and analogue computers to pre-test product and parts.

Electronics has been harnessed by industry today. Its applications are myriad—power rectifiers, motor controls, electronic counters, cutters, gages, inspection devices that give continuous readings, of weight, thickness, width, consistency, etc., quantity and quality controls, electronic softening of metals to be cut by induction heating, digital computers to be the brains of planning and research by doing impossible mathematics, analogue computers to provide physical measurements, electronic eyes, contour shapers, metallurgical determination devices, etc.

But this is the patchwork that Mr. Kaplan spoke about. The real work remains for the future.

"Magic" Computers — Electronics has lent sudden acceleration to communications, with television in the forefront. Video is now scanning dangerous, hard-to-see industrial processes. In 1930 only 52 million vacuum tubes were made, while last year the total was around 450 million. American Telegraph & Telephone has spanned the country with an electronic microwave relay system. Private industry has taken this as a cue for bringing farflung branches together. General Electric has built an 800-mile micro-wave system for Transcontinental Gas Co.

Electronics has pushed deeper into industry through digital and analogue computers.

These computers have not necessarily replaced labor. Rather they make possible through complex calculations, quickly performed, operations never possible before with pen and pencil tactics. Electronic digital computers have transformed the cumbersome business of accounting into a streamlined operation. Payrolls, taxes, profits, dividends, pensions, personnel work are now being masterminded by electronics.

Quickie Breakdowns — Production planning and inventory control are becoming an exact science. Digital computers permit scheduling weeks in advance. Calculation that would have taken mathematicians weeks and months now is done in a feasible time.

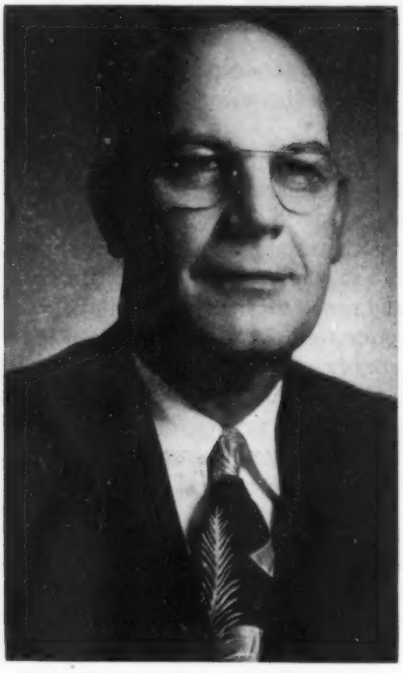
Given a specific number of products, IBM and other calculators can furnish a breakdown of how much machine time will be needed so that production can dovetail. They can inform the producer how much raw material he will need to make a specific number of parts down to the nuts and bolts.

Calculators take the place of a host of engineers in doing the mathematical spadework for pre-testing parts and products. Digital and analogue computers are doing the work of far more expensive wind tunnel testing for aircraft makers. They are unraveling problems only guessed at before.

SALES: Return To Competition?

NIAA holds annual meeting in Chicago . . . Speakers warn of end of sellers' market . . . Price to be strong factor . . . GE's Lang urges personal communications—*By G. F. Sullivan.*

Some 1800 industrial marketing people beat the Republicans—but not the heat—into Chicago this week to spend a few days talking over their problems. New products and new markets and the need to begin real selling again



SPEAKER: J. L. Singleton, vice-president in charge, General Machinery Div., Allis-Chalmers Manufacturing Co.

were among items of interest to metalworking executives at the thirtieth annual conference of the National Industrial Advertisers Assn.

Cary H. Stevenson, vice-president, Linderg Engineering Co., predicted that the capital goods industry would be in for a shock in a year or so. Now businessmen lie awake nights worrying about how to keep some of their profits or where to get the money to pay for new machinery.

In ordinary times a businessman knows pretty well his competitive position. But when a curtain is drawn for a few years he doesn't know what his competition is doing. He may wake up to find that the other fellow can cut prices 25 pct and still do all right. He either has some amazing improvements or entirely new products that have been held back until the sales department needed help to meet competition.

Pricing—Price, Mr. Stevenson believes, is going to be a greater factor than usual. He thinks it might be a good idea to look into a General Electric project: Putting engineers in the purchasing department to study materials and parts to see whether substitutes or design changes can reduce costs. GE is not worrying so much about savings at the moment but when prices get highly competitive they're going to make it tough for somebody.

Also concerned about the buyers' market was J. L. Singleton, vice - president, Allis - Chalmers' General Machinery Div. Industrial advertising must put more push on replacement of obsolete equipment because the nation's future depends on technical superiority based on efficient capital production equipment, he argued.

New Approach—Chester H. Lang did a nice job of taking the corn out of the old "How To Explain The American System . . ." bromide. Mr. Lang, who is a vice-president of General Electric, argued that the communications job must start at the personal level. Mr. Lang didn't dream up this idea himself. Some 91 pct of the people in Schenectady, N. Y. either work for GE or have relations or friends who do. And a survey showed that the chief source of information about the company consists of these people —not newspaper, radio or company publications.

So Mr. Lang suggested that the first step in communications be emotional and personal, in terms of the other fellow's self-interest. Then he will carry your message to family, friends and neighbors.

New president of NIAA elected this week is Gene Wedereit of Girdler Corp. and Tube Turns, Inc. George Black, Cooper Alloy Foundry Co., was elected secretary-treasurer.

Controls

Industry Controls This Week

Aluminum, Copper—Dir. 1, CMP Reg. 2 suspends inventory controls on copper and aluminum.

B Products—Dir. 14, CMP Reg. 1 grants allotments for seven quarters or more in advance to manufacturers of B Products requiring carbon steel castings weighing 10,000 lb or more.

Coal—Amend. 1, CPR 27 authorizes price increase for Great Lakes coal dock operators.

Concrete—SR 108 and SR 66, GCPR permit rise in ready-mixed concrete prices.

Copper—Amend. 21, GOR 9 lifts price controls on sales of foreign primary copper and copper refined from imported ores, cencentrates, and imported raw materials including scrap.

Machinery—Amend. 33, CPR 30 and Amend. 8, CPR 67 ease the pricing system for resellers of machinery and related items.

MRO—Amend. CMP 5 removes cost limit on MRO materials for single industrial projects.

Steel—By exception from Sec. 8, Par. C, M-1, steel plants closed by the strike need not open order books until 15 days after end of the strike.

Tin Cans—Dir. 4, M-25 suspends certain can material specifications from Sched. 1.

Zinc—Revocation of M-9 removes zinc inventory controls.

Turn Page

Controls

Resellers' Pricing System Eased

Resellers of machinery and related items are operating under a more lenient pricing order permitting use of manufacturers' government-approved published price lists.

Supplementary Reg. 2, Ceiling Price Reg. 67, effective June 25, allows use of such lists even though discounts or margins established by them are not identical to those in effect on June 24, 1950. Purpose of the new regulation is to help resellers use their historical practice of computing resale prices, regardless of minor changes in price lists.

Supporting this action, Office of Price Stabilization has issued Amend. 33 to CPR 30, effective June 25, allowing manufacturers of machinery and similar products to apply for approval of published list prices which were in process of revision before June 24, 1950. Manufacturers must apply to Industrial Materials & Manufactured Goods Div., OPS, in Washington.

The agency also has issued Amend. 8, CPR 67, effective June 25, permitting resellers to use manufacturers' published list prices approved by OPS under Amend. 30, CPR 30.

Lakes Coal Docks Get Price Rise

Amend. 1 to Ceiling Price Reg. 27 gives Great Lakes coal dock operators authority to increase ceiling prices by the amount that transportation costs have risen, under Interstate Commerce Commission orders, since Jan. 1, 1951.

Effective July 2, the action was taken to abolish any "possible discrimination" between these and other coal resellers.

Steel Mills Get 15 Days Grace

Steel plants closed by the strike have been notified by National Production Authority that order books for fourth quarter need not be opened until 15 days after the end of the strike.

This exception to Sec. 8, Par. C, M-1 was made, officials said, in order to allow the mills time to get going.

Business Survey:

Study shows executives think third quarter will be on a par with '51

Despite the problems of labor strife, controls, a fluctuating defense economy and the unpredictable international situation, business executives are entering the third quarter with controlled optimism.

Surveyed by Dun & Bradstreet on whether they believe their sales, profits, selling prices, number of employees, inventories and new orders will be higher, lower or the same as in the third quarter of 1951, most of the executives expect to at least hold their own in most categories and predict improvement in others.

A majority of the business men (55 pct) expect a third quarter increase in net sales; 26 pct believe there will be no change, and the remainder (19 pct) think there will be a decrease. Most confident were durable goods manufacturers, with 63 pct anticipating a sales jump in the coming period.

Profit Expectations—Prospects for net profits were split fairly evenly between those expecting an increase (34 pct), those believing they would match last year's third quarter profits (28 pct), and those looking for a drop (38 pct). Nineteen pct expect an increase in their selling prices, but the large majority (60 pct) saw no change. The rest (21 pct) forecast a cut in their prices.

Sentiment regarding expected levels of inventories at the end of the third quarter was generally mixed: 26 pct, increase; 42 pct, no change; 32 pct, decrease. Most unanimous of the survey's forecasts was the belief that employment would remain on a par (77 pct). Only 7 pct expect to have fewer workers, while 16 pct foresee employment rising.

Fifty pct of the manufacturing groups studied anticipate an increase in new orders. Executives in the durable goods line were slightly more optimistic than those handling non-durable goods.

Defense Production Rate Climbs

Complete picture of first-half defense production and deliveries now is scheduled to be revealed on July 4, when the White House releases Office of Defense Mobilization's report for the second quarter.

Meanwhile, it is estimated by Defense Production Chief Henry H. Fowler that current production of military items is running at a rate six times greater than for the pre-Korean period.

Decrying what he calls a public tendency to regard any decontrol action as meaning that mobilization objectives have been reached, Mr. Fowler warns that the nation is no more than halfway through the "military end product preparedness stage."

On the basis of DPA information, deliveries on 120 major military end items increased 50 pct (on dollar value basis) between February and May. It is estimated that second quarter production totals will show a gain of 20 pct above first quarter.

Prior to the steel strike, the agency figured that the delivery of military hard goods in general would double during the calendar year 1952. Military aircraft deliveries were expected to increase even more, perhaps as much as 2½ times, if not more.

Now the agency is not so sure. These estimates are likely to be subject to considerable revising downward after the strike ends. Full impact of the strike is not expected to show up until the last quarter, even if the steel wage dispute should be settled immediately.

"I realize it's a hot day today, Miss Johnson, but these letters are important."

Loans:

Aid to small business for defense work announced by SDPA.

American Machinery Corp., Orlando, Fla., which will turn out 75-mm shell cases for the Army, tops a new Small Defense Plants Administration list of firms receiving government loans to perform military and civilian production.

The Orlando company was granted $750,000 by Reconstruction Finance Corp., issuers of the loan on SDPA recommendation.

Other small business firms getting RFC funds under the same program include:

Salem Foundry & Machine Work, Inc., Salem, Va., with a loan of $150,000 for working capital and equipment buying. This company, with some defense contracts, builds and installs electric and hydraulic elevators.

Harry M. Fleet and Harry Alper, operating as the H and H Co., Haverhill, Mass., granted a $15,000 working capital loan. Firm is a junk yard.

Morgan Steel Products, Inc., Cleveland, O., which got $110,000 for a building, debt payments, and working capital. This enterprise fabricates steel into pipe, bins, tanks and related items.

Enduro Products Inc., Miami, Fla., manufacturers of custom-made aluminum products, with a $25,000 loan for construction.

L. & W. Metals & Manufacturing Co., Los Angeles, Calif., granted a loan of $15,000 for working capital and machinery buying. This machine shop is engaged primarily in cutting metal for aircraft parts.

Gustaveson, Inc., Kansas City, Mo., recipients of $120,000 for working capital. Products of the company are panel boards for electric, pneumatic, or hydraulic control or tests.

John W. Downing, trading as Downing Crystal Co., Baltimore, Md., and producing crystals for military electronic equipment, authorized a $69,500 loan.

Patrick & Sons, Inc., Philadelphia, Pa., with a loan of $40,000 for working capital. Steel products, including tanks, ducts, and conveyers, are made by the firm.

—Defense Contracts—

Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Dryer, aggregate, single drum, 2 ea, $45,684, Barber-Greene Co., Aurora, Ill.

Roller, road 14 ea, $77,700, Galion Iron Works & Mfg. Co., Galion, Ohio.

Gun, lubricating, 2000 ea, $34,335, Stewart Warner Corp., Chicago, *E. N. Osterberg.*

Drill, pneu, var, $135,583, Ingersoll-Rand Co., Chicago.

Digger, 220 ea, $28,014, Worthington Pump Corp., Chicago.

Crane unit, 20 ea, $180,791, Hyster Co., Portland, Oregon.

Spare parts, var, $42,947, Perfection Steel Body Co., Galion, Ohio.

Spare parts, var, $24,442, General Motors, Detroit, *R. C. Campbell.*

Spare parts, var, $164,279, Fairbanks-Morse & Co., Chicago.

Spare parts, var, $27,197, Climax Engine & Pump Co., Clinton, Ia.

Spare parts, var, $57,987, The Electric Auto-Lite Co., Toledo.

Spare parts, var, $73,707, General Motors Corp., Cleveland, *A. O. Chash.*

Spare parts, var, exceeds $250,000, R. G. LeTourneau, Inc., Peoria, Ill.

Spare parts, var, $154,682, Waukesha Motor Co., Waukesha, Wis.

Spare parts, var, $53,549, Electric Auto-Lite Co., Toledo.

Spare parts, var, $73,114, General Motors, Detroit, *R. C. Campbell.*

Spare parts, var, $43,560, Allis-Chalmers Co., Milwaukee, *F. R. Worley.*

Spare parts, var, $31,766, Ford Motors Co., Edgewater, N. J.

Spare parts, var, $50,214, General Motors Corp., Detroit.

Spare parts, var, $42,501, Barber-Greene Co., Aurora, Ill.

Spare parts, var, $36,355, Electric Auto-Lite Co., Toledo.

Spare parts, var, $28,578, General Motors, Detroit, *J. E. McKenna.*

Spare parts, var, $47,315, Barber-Greene Co., Aurora, Ill.

Spare parts, var, $145,431, International Harvester Co., Chicago.

Spare parts, var, $64,679, Barber-Greene Co., Aurora, Ill.

Spare parts, var, $25,224, Barber-Greene Co., Aurora, Ill.

Spare parts, var, $94,832, Barber-Greene Co., Aurora, Ill.

Spare parts, var, $95,814, Bucyrus-Erie Co., Milwaukee.

Spare parts, var, exceeds $250,000, Bucyrus-Erie Co., Evansville, Ind.

Spare parts, var, $48,451, Chicago Pneu Tool Co., Chicago.

Spare parts, var, $122,558, Eidel Mfg. Co., Alburquerque, N. M.

Spare parts, var, $28,640, Dorsey Trailers, Inc., Elba, Ala.

Sets of parts for activator, 573000, $63,411, Mack Molding Co., Inc., Wayne, N. J.

Steam generating equipt, exceeds $250,000, Power Piping Co., Cambridge, Mass.

Spare parts, var, $182,385, American Hoist & Derrick Co., St. Paul, Minn.

Spare parts, var, R. G. LeTourneau, Inc., Peoria, Ill.

Fuze, 150000, exceeds $250,000, Dale Valve Co., Chicago.

Fin, shell, M2, 600000, exceeds $250,000, Line Material Co., Milwaukee.

Spare parts, var, $46,958, General Motors Corp., Detroit, *R. C. Campbell.*

Spare parts, var, $59,818, Galion Iron Works & Mfg. Co., Galion, Ohio.

Spare parts, var, 34,549, Bearings-Eubler, Cicero, Ill.

Spare parts, var, $28,661, Marlin Rockwell Corp., Jamestown, N. Y.

Spare parts, var, $54,482, General Motors Corp., Bristol, Conn., *L. A. Lanning.*

Fuze, 12300, exceeds $250,000, Nation Pressure Cooker Co., Eau Claire, Wis.

Track sections, 37750, exceeds $250,000, U. S. Rubber Co., Ft. Wayne, Ind., *W. H. Streator.*

Fin, shell, M2, 1000000, exceeds $250,000, National Day Co., Chicago.

Feed mechanisms, exceeds $250,000, Sunbeam Corp., Chicago.

Fuze, bomb, exceeds, $250,000, General Time Corp., LaSalle, Ill., *W. B. Sampson.*

Shell, HE, 155MM, 300000, exceeds $250,000, The Oliver Corp., Chicago.

Topping winch, 28, $128,129, Berger Engineering Co., Seattle, Wash.

Under wing pressure fueling nozzles, $20, $211,978, The Parker Appliance Co., Cleveland.

Pumps, 48, exceeds 250,000 DeLaval Steam Turbine Co., Trenton, N. J.

Remote water level indicators, 1000, $189,285, Yarnall-Waring Co., Phila.

Spare propeller assys, 16, $56,480, Bethlehem Steel Co., N. Y.

Spare parts, var, $94,405, ACF Brill Motors Co., Phila.

Fuze, grenade, 135000 ea, $53,231, Bayshore Industries, Inc., Elkton, Md.

Tank, 90MM gun, 1178 ea, exceeds $250,000, Chrysler Corp., Detroit.

Detonator, 350040 ea, exceeds $250,000, E. I. duPont de Nemours Co., Wilmington.

Inner liner assy, for case cartridge, 459,200 ea, $73,439, The Edlon Herman Co., Phila.

Mortars, 81MM, 2400, exceeds 250,000, A. B. Farquhar Co., York, Pa.

Case, cartrdige, 742000 ea, exceeds $250,000, Rheem Mfg. Co., Burlington, N. J.

Fuze, 1450000 ea, exceeds $250,000, Supreme Knitting Machine Co., Inc., Brooklyn, N. Y.

Spare parts for directors M9 and M10, lot, exceeds $250,000, Western Electric Co., Inc., New York.

Transmission assys, 120 ea, exceeds $250,000, American Type Fdrs., Elizabeth, N. J., *Milton J. Goger.*

Spare parts for fuze setter rammer M20, lot, exceeds $250,000, Commar Products Corp., Newark.

Shell, HE, 600000, exceeds $250,000, Rheem Mfg. Co., Linden, N. J., E. R. Boothman, 2-10100.

Metal parts for fuze, 1000000 ea, exceeds $250,000, Commar Products Corp., Newark.

Metal parts for fuze, 1755000 ea, exceeds $250,000, Regina Corp., Rahway, N. J.

Container, ammo, metal M241 for rockets, 2000000 ea, exceeds $250,000, Standard Container, Montclair, N. J.

Box, master junction, 200 ea, $111,890, Bendix Aviation Corp., Teterboro, N. J., *F. A. Battel.*

Case, cartridge, 747000 ea, exceeds $250,000, Rheem Mfg. Co., Burlington, N. J.

Government Inviting Bids

Latest proposed Federal procurements, listed by item, quantity, invitation No. or proposal and opening date. (Invitations for Bid numbers are followed by "B," requests for proposals or quotations by "Q.")

The Engineer Center, Fort Belvoir, Virginia.

Blast intensity indicators, 500 ea, S-44-009-52-54, June 27.

Columbus General Depot, Columbus, Ohio.

Timer assy, 400 ea, 52-973B, July 7.
Control assy, temperature tumbler heater, 100 ea, 52-973B, July 7.
Coil set, manual motor starter, 125 ea, 52-973B, July 7.
Relay, 100 ea, 52-973B, July 7.
Starter assy, 400 ea, 52-973B, July 7.
Contact, stationary, 200 ea, 52-973B, July 7.
Thermometer, dial, 125 ea, 52-973B, July 7.
Expansion valve, 400 ea, 52-973B, July 7.
Control, high pressure, 75 ea, 52-973B, July 7.
Switch, temperature control, 100 ea, 52-973B, July 7.
Thermometer, dial, 250 ea, 52-973B, July 7.
Thermometer, assy, 125 ea, 52-973B, July 7.

Watertown Arsenal, Watertown, Mass.

Shankless tool bits for carbide tipping, 5175 pcs, 52-290B, July 21.

Ordnance Tank Automotive Center, Detroit.

Brkt, 360, 52-3217B, July 3.
Chute, 20000, 52-4217B, July 3.
Retainer, 1700, 52-4218B, July 3.

Tooele Ordnance Depot, Tooele, Utah.

Power belt conveyor, 10 ea, 74, June 27.

Letterkenny Ordnance Depot, Chambersburg, Pa.

Body and engine parts for var military vehicles, 83 itm, 52-169B, July 17.

Corps of Engineers, Pittsburgh.

Pontoon, 2030 ea, Eng 36-058-52-213B, June 25.
Post handrail, 5800 ea, Eng-36-058-52-213B, June 25.
Treadway, 2030 ea, Eng-36-058-52-213B, June 25.
Snap, boat, 5824 ea, Eng-36-058-52-213B, June 25.

Steel Inquiries and Awards

May shipments of fabricated structural steel, according to reports compiled by the American Institute of Steel Construction, amounted to 241,743 tons, an increase of 5% over the previous month. Total shipments for the first five months of this year were 1,232,610 tons or at an annual rate of 2,958,264 tons.

Bookings during May were 210,118 tons, practically the same as the previous* month. The total bookings for the first five months of 1952 amounted to 1,089,685 tons.

Backlog of work ahead as of May 31 stands at 2,263,443 tons.

A tabulation showing the detailed figures for the five months is given below:

Estimated Total Tonnage for the entire industry

CONTRACTS CLOSED	1952	1951	Avg. 1947-1950
Total Tonnage			
January	213,110	361,373	161,976
February	230,832	256,746	152,186
March	226,394	297,517	221,387
April	209,231*	337,026	177,825
May	210,118	268,166	176,266
Totals	1,089,685	1,520,828	889,640
SHIPMENTS			
January	244,947	214,000	166,910
February	246,398	193,638	161,170
March	268,840	237,087	191,297
April	230,682*	234,095	192,861
May	241,743	234,486	198,426
Totals	1,232,610	1,113,306	910,664
TONNAGE OF BACKLOG	2,263,443	2,771,264	1,192,401
Percentage scheduled for production within the next four months (To Sept. 30)	46%	40%	55%
Percentage scheduled for production after the next four months (From Oct. 1)	54%	60%	45%

*Revised

Fabricated steel awards this week include the following:

3662 Tons, Boston, Mass., superstructure, Commerce St. to Oliver St. Awarded to Harris Structural Steel Co., New York, N. Y.

2930 Tons, Philadelphia, gas holders for Philadelphia Gas Works Co., to Koppers Co.

2000 Tons, Birdsboro, Pa., building addition for Valley Forge Associates, to Belmont Iron Works, Philadelphia.

450 Tons, Luzerne County, Pa., highway bridges for Pennsylvania State Dept. of Highways, to Anthracite Bridge Co.

280 Tons, Philadelphia, tank work at Point Breeze, to Chicago Bridge & Iron Works.

200 Tons, Salem County, N. J., highway bridge for New Jersey State Highway Dept., to Phoenix Bridge Co., Phoenixville, Pa.

Fabricated steel inquiries this week include the following:

2936 Tons, Berks, Schuylkill Counties, Pa., highway bridges for Pennsylvania State Highway and Bridge Authority, to be rebid July 18.

540 Tons, Allegheny County, Pa., highway bridges, Pennsylvania State Dept. of Highways, bids due July 11.

Reinforcing bar awards this week include the following:

250 Tons, Bethlehem, railroad bridge for Philadelphia, Bethlehem and New England Railroad Co., G. A. and F. C. Wagman, Inc., Dallastown, Pa., general contractors, to Bethlehem Steel Co., Bethlehem.

185 Tons, Philadelphia, elementary school at Gowen and Pickering Streets, McCloskey & Co., same city, general contractors.

Reinforcing steel inquiries this week include the following:

156 Tons, Essex, Gloucester, and Manchester, Mass., bituminous concrete, bituminous macadam asphalt and five bridges, Charles A. Fritz, Beverly, Mass., district engineer. Completion date June 15, 1954.

Here comes Aluminum

The amount of electricity it takes to produce one ton of aluminum is enough to light your house for 15 years! Thus aluminum production takes a lot of water power.

The torrent above is a view of the mighty Saguenay River, which turns the turbines of the 1,500,000-horsepower Shipshaw hydroelectric plant that supplies power for the Aluminum Company of Canada—one of the world's great aluminum producers.

Alcan, as most of us in the business call it, is one of the Aluminium Limited companies, whose products we distribute.

Utilizing great power resources and modern production facilities, we are supplying millions of pounds of aluminum which are being employed to strengthen transportation, essential industry, and military security. At the same time, we are striving to relieve the shortage of aluminum for the thousands of other uses where its qualities are desirable—and desired.

ALUMINUM IMPORT CORPORATION

Distributing company, in the Western Hemisphere, of the **ALUMINIUM LIMITED** *group*

Offices and agents in 40 cities
630 Fifth Avenue, New York 20 Av. Ing. Luis A. Huergo 1279, Buenos Aires Rua da Quitanda 96, Sao Paulo

Cable address: ALIMPORT

Industrial Briefs

New Offices—David W. Jones, Jr., sales representative, Tubular Products Div., BABCOCK & WILCOX CO., Beaver Falls, Pa., opened new offices in the Goby Bldg., 1321 Bannock St., Denver, Col.

Company Purchased—THE KAYDON ENGINEERING CORP., Muskegon, Mich., has purchased A. Harold Frauenthal, Inc.

Re-Elected—J. L. Crawford, president, Walsh Refractories Corp., St. Louis, Mo., was unanimously re-elected president of THE REFRACTORIES INSTITUTE, and W. A. Turner, president, McLain Fire Brick Co., was re-elected treasurer.

Wrong Impression — Recent mention on this page of a plant leased by LACLEDE-CHRISTY CO., St. Louis, from Stupp Bros. Bridge & Iron Co., requires clarification. The leased plant had been previously purchased by Stupp Bros. from Blackmer & Post Pipe Co. It is a vitreous sewer pipe plant. Stupp Bros., who have been in structural steel fabrication and warehouse business for 96 years, will continue these operations.

Eighth Meeting—Metallurgists of six Pennsylvania chapters of American Society for Metals met at Penn State College last week. This was the eighth bi-annual interchapter meeting sponsored jointly by ASM and Div. of Metallurgy of Penn State College.

Nominated — Frederick S. Blackall, Jr., president and treasurer, Taft-Peirce Mfg. Co., Woonsocket, R. I., has been nominated as 1953 president of AMERICAN SOCIETY OF MECHANICAL ENGINEERS.

First British License—First British license for the use of SOLAR AIRCRAFT COMPANY'S process for producing complex sheet metal shapes has been issued to Rolls-Royce Ltd., Derby, England.

New Quarters—PORCELAIN ENAMEL INSTITUTE will occupy new quarters in the Dupont Circle Bldg., 1346 Connecticut Ave., Washington, D. C.

Distributor Named—THE PARKER APPLIANCE CO., Cleveland, has named Hydraulic Power & Equipt. Co., Portland, Ore., as their distributor for O-ring seals.

Elected—Frank D. Brisse, president, Laconia Malleable Iron Co., Laconia, N. H., was elected president of MALLEABLE FOUNDERS' SOCIETY; George T. Boli, president of Northern Malleable Iron Co., St. Paul, was elected vice-president, and Lowell D. Ryan, of Cleveland, was re-elected secretary-managing director.

Trophy Presented — For the second consecutive year, Ruan Transport Corp., Des Moines, was presented with the TRAILMOBILE TANK TRUCK TROPHY. The trophy is awarded each year to the tank truck operator with the best record during the year for safety and courtesy on the highway.

Department Moved—The special miniature lamp department of WESTINGHOUSE ELECTRIC CORP'S Lamp Div., will be moved from Bloomfield, N. J., to Richmond, Ky.

Directory Published — GRAY IRON FOUNDERS' SOCIETY recently published a Directory of Members including a list of over 550 foundries in the U. S.

DISCUSSION: Sales and engineering executives of Bullard Co. and Kennametal discuss the merits of carbide tooling at Bullard's Bridgeport, Conn., plant. Left to right: Louis Boudis, Bullard chief engineer; W. D. Turnbull and W. L. Kennicott, Kennametal's general sales manager and chief engineer, respectively; and F. U. Hayes, vice-president, sales, Bullard.

Order Placed—U. S. Army Transportation Corps has placed an order with PRESSED STEEL CAR CO., INC., for 204 80-ton flat cars.

Construction Completed—Contracting Div., DRAVO CORP., Pittsburgh, has completed the construction of water intake facilities in the Delaware River at Gibbstown, N. J., to serve the new Greenwich steam and by-product electric generating station of Atlantic City Electric Co.

Employee Training Program—CHASE BRASS & COPPER CO., Waterbury, Conn., a subsidiary of Kennecott Copper Corp., has announced an employee training program to assist employees in the development of greater abilities.

New Factory—New $3 million factory for the WILLARD STORAGE BATTERY CO., on Emmaus Highway, Allentown, Pa., has just been completed. Partial production of storage batteries is now under way.

Division—Leland Electric Co., will become a division of AMERICAN MACHINE & FOUNDRY CO., New York.

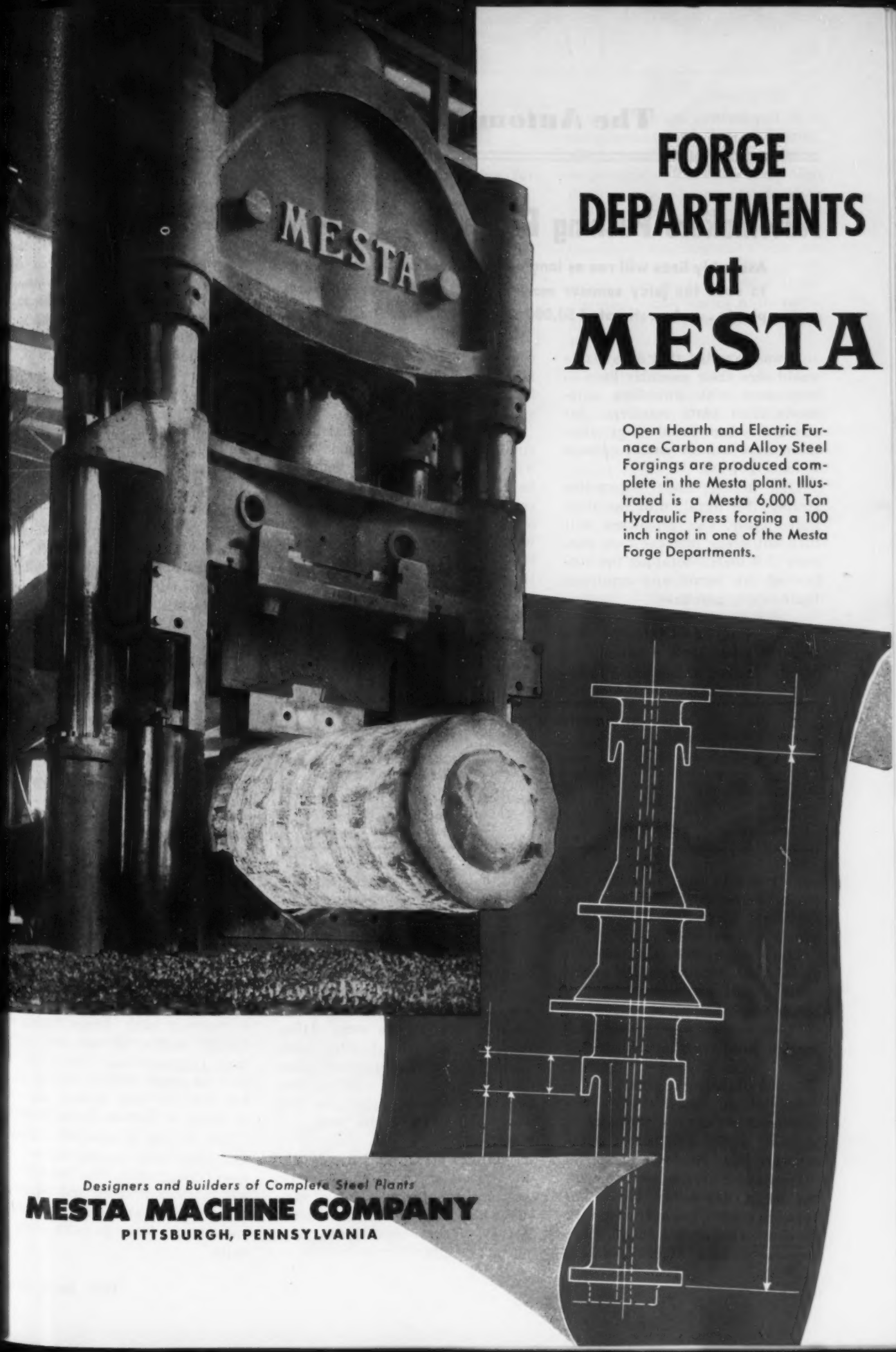
Named—Electrical Equipt. Co., 301 W. State Blvd., Ft. Wayne, Ind., has been named a distributor for ALLIS-CHALMERS MFG. CO., Milwaukee.

Second Expansion — DIAL SCREW PRODUCTS CO., INC., Woodside, N. Y., has completed a new plant at 126-02 Northern Blvd., Corona, N. Y. This is the second expansion move during the past year for the company.

Combine—Kewanee Boiler Corp. and Ross Heater & Mfg. Co., Inc., two divisions of American Radiator & Standard Sanitary Corp., have combined to form a new company, KEWANEE-ROSS CORP.

Subsidiary Organized — KOEHRING CO., Milwaukee, has organized another subsidiary company known as Koehring Southern Co.

Sales Office—Albany sales office for LUKEN STEEL COMPANY will be located in the Home Savings Bank Bldg., 17 North Pearl Street.



FORGE DEPARTMENTS at MESTA

Open Hearth and Electric Furnace Carbon and Alloy Steel Forgings are produced complete in the Mesta plant. Illustrated is a Mesta 6,000 Ton Hydraulic Press forging a 100 inch ingot in one of the Mesta Forge Departments.

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

Automakers Pushing Production

Assembly lines will run as long as parts hold out in an attempt to save the juicy summer market . . . Layoffs start in parts plants . . . An estimated 50,000 are now idle—*By R. D. Raddant.*

It was expected that auto plants would slow their assembly lines to keep pace with dwindling shipments from parts suppliers. Instead, they kept them rolling while there were enough parts on hand to make one car.

This action made automotive strategy for duration of the steel strike clear. Car producers will turn out every last car they can, even if it means scraping the bottom of the barrel and emptying their supply pipelines.

Change of Site—Actually, this decision made little difference in layoffs. Instead of beginning in assembly plants as production was cut back gradually, they began in the parts plants when the steel supply was exhausted.

Truth of the often-repeated complaint that forging billets were critical was soon illustrated. Chevrolet's forging plant suddenly laid off 2400 workers for the first major shutdown from lack of steel.

50,000 Idled—Engine plants, foundries, and service parts followed suit. At the end of the week, probably 50,000 automotive workers were idled as steel ran out.

Ford and Chrysler were operating on a day-to-day basis and hoped to stretch out operations for the short week ending July 3. Nash announced that 10,000 workers would be idled at that date. Fisher Body fabricating plants started layoffs when sheets dwindled to minute stocks.

It was first expected that plans similar to Ford's original 4-day week proposal would be followed. In this way paychecks would be cut, but not with the suddenness of a complete loss of the work week. This seems inevitable now, even if steel is produced in a short time.

Not NPA's Fault—Ford blamed National Production Authority's system of quota allotments for its change in plans. But it went deeper than that. NPA had been generous previously in making allowances for strikes.

Strategy could be traced directly to the market, which had never been what dealers wished for all year. The market at the moment is strong, but looking ahead raises some doubts. It the steel strike stretched out, the buying peak might be over and summer sales lost. So the decision was reached to make what they could now and worry about the results later.

Weather Cuts Operations—While the brains of the auto industry grappled with the problems of layoffs, when to start them and where, Mother Nature took things into her own hands.

Soaring temperatures and high humidity caused sweltering conditions in plants throughout the Midwest. Walkouts followed. In one day alone 29,000 auto workers were voluntarily idled. About 20,000 just walked off their jobs, but 9000 asked and received permission to leave their plants.

Extend Hospitalization—Kaiser-Frazer, one of industry's leaders in providing retirement plans and other social security benefits, extended retirement benefits to include hospitalization, medical and surgical care.

The K-F retirement plan was negotiated with the UAW (CIO) in 1948, the first in the auto industry. The extension of hospitalization benefits (Blue Cross plan) followed a UAW survey showing that medical bills were the most important single factor cutting into savings of retired workers.

Cost of the extended hospitalization will be borne by the social security fund. K-F pays 7-2/3¢ per hr into the fund for each hour an employee works.

Orlon Top—Hudson became the first auto company to put "Orlon," the so-called miracle fabric, to use as a convertible top. The company claims it is highly resistant to sun, weathering, abrasion and stretch. It is available at a slightly higher cost than the conventional top.

Tank Transmissions — Allison Div. of General Motors is closing a contract with Army Ordnance for $20 million in new and larger tank transmissions. They will be used on a new military vehicle that has not yet been named. It will be made at Detroit Tank Arsenal.

The division is currently making two other tank transmissions. The new transmission, like the others, will combine braking and steering with hydraulic shifting. It will have about 35 pct fewer parts than other units.

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS	TOTAL
June 28, 1952	97,076*	28,289*	125,365*
June 21, 1952	101,386	27,931	129,317
June 30, 1951	121,100	35,005	156,105
June 23, 1951	124,570	34,339	157,909

*Estimated

Source: *Ward's Reports*

RESEARCH: GM Shows Off New Lab

New metallurgical building houses extensive facilities for developing new materials, cheaper methods . . . Need of finding non-strategic goods complicates job . . . Some problems.

Inside the brightly colored brick, glass and steel walls of the newest building in the General Motors Technical Center, GM metallurgists are grappling with the toughest problems confronting industry today.

Compounded with the obvious problem of obtaining better materials by cheaper methods, is a third puzzle unique in industry today.

Under our defense economy these better materials must be non-strategic items economically available in North America.

This was the real story last week when Charles L. McCuen, GM vice-president and general manager of the research laboratories, showed off the new metallurgy building.

The new building will house this department under Dr. Robert F. Thomson, head of research metallurgy. Within its spacious walls are equipment and facilities such as a sand control laboratory, wear and corrosion laboratories, aluminum dipping section, jobbing foundry, machine shop, several types of furnaces, presses, and other testing and research facilities.

New Items—Among recent developments of GM metallurgy research are the Aldip process (THE IRON AGE, June 12, 1952, p. 115), GMOODIE, or short-run die metal for GM overseas divisions, shell molding, and important wear and corrosion tests. Industry's annual bill for corrosion is unflaggingly astronomical.

Many of the projects underway in the metallurgy building are under strict security. Dr. Thomson explains that one-third of all projects have defense applications, principally jet engines.

Six new materials have been developed recently by GM metallurgists. They are GMOODIE, which has four times the wear resistance of zinc dies, a tin filled groove piston ring for diesels, wear-resistant powder metals, wear resistant cast iron, known as GM R515, wear-resistant bronze for bushings, and wear-resistant chrome plating.

Among the chief problems still faced by the industry are corrosion, better high temperature alloys for turbines, and developing substitutes for nickel.

GM metallurgists have a project list of 36 major problems that must be faced plus 25 pct more that cannot be disclosed because of defense reasons.

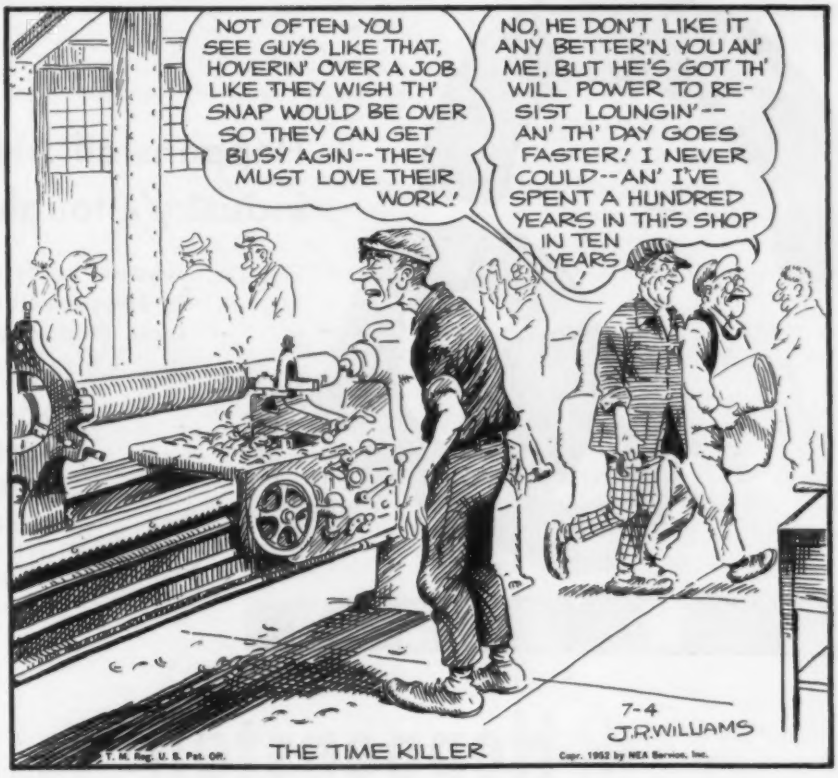
Tops List—At the head of the list is the unsolved problem of non-vacuum melting of titanium. Until a more economical method of obtaining titanium is developed, it is not practical for industry. Current cost of about $15 per lb is regarded as prohibitive for many uses. But despite price, some applications find great advantage in the metal.

Other key projects include the brazing of titanium and alloys, improvement of the ductility of diffused Aldip products, solder of Aldip steel, distortion of Aldip parts, and bonding aluminum to cast parts.

Three GM divisions are now using shell molding. Although it saves a great deal of machining costs and wasted material that follow sand molding, it is still more expensive in many cases. Dr. Thomson considers finding a more inexpensive bonding material for shell molding a leading job.

Long range planning of the metallurgy research building includes a "hot" laboratory for the use of radioactive isotopes. Isotopes are already being used in the automotive industry as tracers and to detect structural flaws. Other adaptations, still undisclosed, are in the wind for future research.

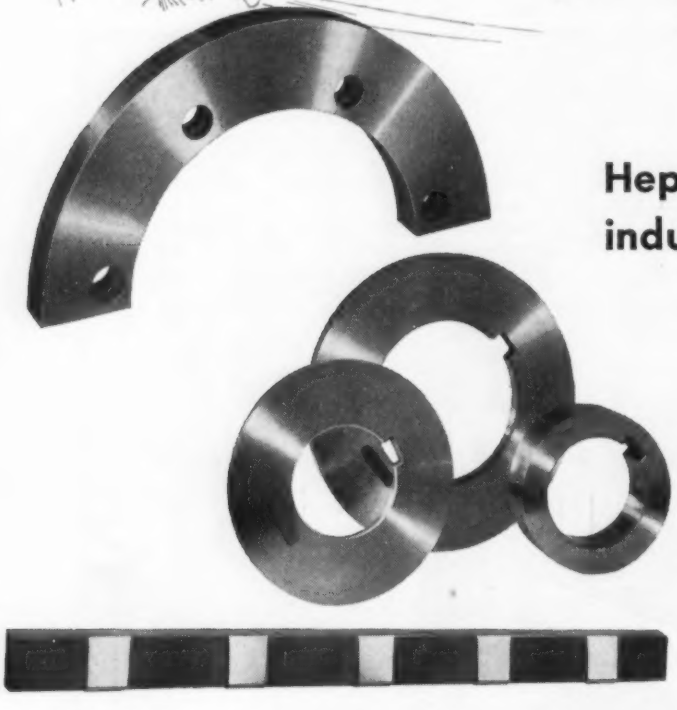
THE BULL OF THE WOODS By J. R. Williams



famous blades

The Cutlass . . . tough as the bold crews who fought across the seven seas

Through the naval actions of several centuries, the cutlass won fame as the hand weapon of the sailor. Like the men who wielded it, the Cutlass was a hardy blade. At times, it was used to shear away the rope and wood of rigging wrecked by gunfire.



Heppenstall **SHEAR KNIVES** . . . do industry's tough cutting jobs

Like the handy cutlass, modern shear knives made by Heppenstall are built to take it. Through technical development, they are continually improved to give better service and provide:

- ★ MORE CUTS BETWEEN GRINDS
- ★ MORE UNITS PER BLADE
- ★ LOWER OVERALL BLADE COST
- ★ INCREASE IN PRODUCTION

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Heppenstall — *the most dependable name in shear knives*

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There'll be Some Changes in Controls

Materials control will stick with provision for pre-Korean competitive position . . . Price ceilings cave in, WSB revamped, ask T-H use . . . Writeoffs near end—*By G. H. Baker.*

Life under the new control law is going to be somewhat easier—but not much—during the next 10 months. While the new version of the Defense Production Act that became effective this week does not alter in any substantial way the pattern of existing controls over the metalworking industries, it does free businessmen from the burden of filing voluminous price-control forms on products selling below ceiling, and it carefully and specifically directs the Wage Stabilization Board to stay out of non-wage issues.

And, for whatever it's worth, President Truman has been officially "requested" to use the Taft-Hartley law to end the steel strike.

Here are the key points in the new control law:

Materials Controls—All federal authority to regulate the uses of steel, copper, and aluminum is extended through June 30, 1953. National Production Authority may, of course, amend its regulations as it sees fit. Congress scrapped an earlier plan to require NPA to consider the pre-Korea competitive situation of firms applying for any allotments. U. S. is to continue its membership in the International Materials Conference. New provision permits U. S. firms to get the right to bid for unused or unwanted materials allocated abroad.

Price Controls — Ceilings on metals and metal products are to continue, subject to discretion of Office of Price Stabilization, until May 1, 1953. Many ceilings on food products are raised or entirely removed. Business firms are exempted from the burden of filing OPS forms on products selling below ceilings.

Wage Controls — Tri-partite Wage Stabilization Board stays in business until May 1, 1953. But it is barred from intervening in any labor dispute and it may not issue any new general wage order. From here on, all nominations to board membership are subject to Senate approval. Groups now exempt from wage controls: Engineers, architects, workers in firms employing eight or fewer persons, all farm help, certified public accountants, and persons earning less than $1 per hr.

Installment Buying—Authority to impose Regulation W (which fixes minimum credit terms) has been completely removed from the law.

With respect to both price and wage controls, the White House is directed to suspend these controls in all cases where such action would not have a "dangerous, unstabilizing effect."

Congressional leaders say the new defense production act is "a good law." Whether or not it's going to be any more workable than the old one remains to be seen.

Crack in Door—End is just about in sight for fast amortization of defense facilities. Government planners are agreed that current industrial expansion commitment goals soon will be reached.

Keep in mind, however, that Washington is not slamming the door on all fast-amortization applications. Bulk of the incentive program is finished, wrapped up, and agency employees are being released to other defense offices.

But "applications of merit" still will be considered by Defense Production Administration — and will be approved—for some time to come. Real salesmanship on the part of any interested company will be required to convince the government of the need for 5-year writeoffs from here on out.

Too Early to Tell—Approval by a House subcommittee of legislation permitting producers and manufacturers to meet their competitors' prices doesn't necessarily mean that the bill will become law at any early date. There still is plenty of opposition to the measure, particularly from the Federal Trade Commission.

Although the bill has cleared the hurdle of Senate approval, it faces a rocky path in the House, and an almost-certain veto from President Truman. A White House veto would finish off the measure for the balance of this year since the congressional recess precludes any opportunity to try to re-pass the bill over a veto.

Pricing Leniency—The measure allows sellers to meet their com-

"Probably I Won't"

Earlier predictions that the White House would indefinitely ignore the Taft-Hartley law as a means of reopening the struck steel mills are being bolstered by new hints from President Truman that he has no intention of invoking the law.

"Sometimes it is not possible" for the President to carry out laws passed by Congress, Mr. Truman told a group of White House visitors. It doesn't happen very often, but "it can happen," he declared.

Thus, Mr. Truman continues stubbornly to maintain his position that he, rather than the Congress, decides what is the will of the people.

petitors' prices, if the matching is done in good faith and to meet competition. Matched prices resulting from collusion among producers would be prohibited.

In the event of federal prosecution, a seller could properly maintain, it is said, that he met another firm's price to stay in business, and that he had no reason to believe that the competitor's price was illegal.

Get RFC Out—Withdrawal of active government participation from such basic industries as tin and rubber long has been one of the subjects on which Congress prefers talk to action.

As a result, the House last week didn't bother to record the votes on final approval of legislation authorizating the Reconstruction Finance Corp. to run the government's $750 million synthetic rubber industry for another 21 months. President Truman is expected to sign the bill this week.

Under the bill, RFC must tell the White House and the Congress by Mar. 1, 1953, how and when the government should get out of the synthetic business. RFC, meanwhile, has hired Morton E. Yohalem to write rules governing sales of synthetics plants to private firms.

Want a Job?—U. S. Atomic Energy Commission is again in the market for college graduates in the sciences and in engineering. AEC plans to hire 170 new technical men during the next 12 months for engineering work at its Oak Ridge (Tenn.) laboratory. Of this number, 30 are to hold Ph. D. degrees, 30 Master's degrees, and 95 Bachelor's degrees.

At Los Alamos, the government plans to hire another group of 170 specialists in the sciences and in engineering. Personnel needs at Los Alamos center around mechanical, electrical, and chemical engineering fields. Even after this big hiring project is completed, AEC officials say they'll still be in the market for about 25 to 35 new engineers each year.

Lead Tariff Restored by Truman

Restoration of the lead tariff, effective June 26, was ordered last week by White House proclamation.

Under the suspension law, restoration of the ¾¢-per-lb import duty is mandatory upon the President when the market price for any 1 month averages less than 18¢ per lb.

A duty of 1 1/16¢ on lead content of bullion and bars was restored automatically under the order.

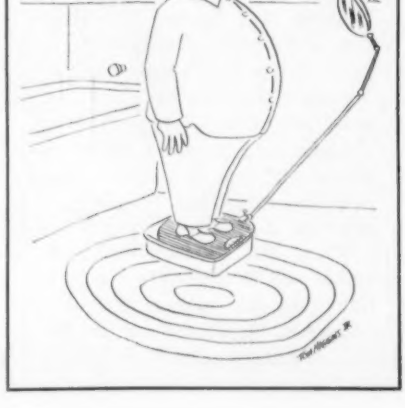
Security:

MSA guarantees U. S. foreign investments against expropriation.

If you have surplus money for investment but won't send it overseas for fear that shifting political conditions may result in seizure of plants by foreign governments, you can relax a little. Mutual Security Agency (successor to ECA) will now guarantee your investment against this sort of high-handed action in some countries.

This is another step forward in MSA's eager campaign to get American dollars working overseas. MSA is "advertising" its new inducement in a newly-issued booklet, *Protection of American Investments Abroad.*

To date, the agency has put through two expropriation agreements with Western Germany.



Early in the European aid program, ECA began guaranteeing returns on investments abroad—that is, guaranteeing that specific amounts of the returns could be converted into dollars.

No Action Needed—Close to $38 million has been put into European industry by American investors under such guarantee. As of Apr. 1, returns of about $430,000 have been realized and the agency has not been called upon to take any action.

So far, MSA has been able to wangle guarantees against expropriation from ten nations.

They are: Austria, Belgium, China (Formosa), Denmark, France, Republic of Germany, Greece, Italy, Norway, and the Philippines. No such agreement with England has been announced.

As a sidelight, early figures indicate that as of June 30, MSA will have allotted $1 billion for European recovery since taking over from ECA 1 year ago.

This makes the total of such allocations to Europe under the Marshall Plan roughly about $13.5 billion.

Wildcat Quota Boosts Studied

Petroleum Administration for Defense is considering a hike in allocations of oil country tubular goods for wildcat drilling—as soon as possible after the strike ends.

Present plans are to boost the present quarterly allocations of 22,200 tons to at least 25,000 tons.

Reports to PAD indicate that in some areas more pipe is being used by the wildcatters than has been assigned to emergency stocks for the purpose. This means borrowing from the bigger operators.

This must eventually be paid back, PAD says, and the present rate of allocation is inadequate to permit repayment and continuation of wildcat drill rates.

And, in turn, wildcat drilling is essential if the new target of 55,000 to 60,000 holes a year is to be reached. No purchase authorizations are now being issued on emergency stocks.

Mills Try to Move Defense Steel

Union cooperating in most cases but some obstacles crop up . . . WSB-recommended wages, use of union men only among demands . . . Tonnages involved are small—*By T. M. Rohan.*

Efforts were under way at steel mills last week to "spring" finished direct-defense tonnage from behind company gates. But there were several hurdles. In general, plans were being worked out amicably at the local level with the CIO United Steelworkers. In several instances, however, major obstacles stood in the way.

At the Geneva plant of U. S. Steel the union was insisting none but union hands would touch the steel. Of the 67 men normally necessary for shipping, billing, invoicing, etc., eight are non-union. Although only a day's work is involved, the company is opposed to denying these men the work because they are non-union.

Total tonnage meeting the defense criteria of Presidential Aide John R. Steelman was only 1414 tons, 1300 in plates and the remainder structural. It represented less than 10 pct of the total tonnage still on company property.

Maintenance Only—At the Geneva plant only supervisory maintenance personnel are allowed in and out while at the neighboring Ironton blast furnace the same CIO local is furnishing maintenance men.

At the Torrance, Calif., plant of U. S. Steel the union is insisting workers removing defense tonnage be paid the WSB-recommended wages. Defense tonnage there is only 175. At the Pittsburg, Calif., plant the 600 tons of direct defense steel were expected to be moved as soon as details can be worked out.

Government agencies including Atomic Energy Commission have conferred with operating producers and some production schedules have been altered but tonnage involved has been small. Other operating and non-operating firms indicated their defense tonnages were less than 10 pct of that on hand.

At week's end U. S. Steel, apparently girding for a long siege, was encouraging salaried workers to take their vacations.

More Tin Cans—Increasing agricultural yield in the fertile San Joaquin Valley and the Delta area of California and installation of new western tinplate facilities brought a new multi-million dollar plant to Stockton, Calif., last week.

JUMBO: Gordon Reed, special assistant to General Hoyt Vandenburg, General E. W. Rawlings, Commanding General, Air Materiel Command, Wright Patterson Air Force Base, and D. A. Rhoades, vice-president and general manager, Kaiser Aluminum & Chemical Corp., preview largest ingot ever cast for Air Force's $389,000,000 heavy press program.

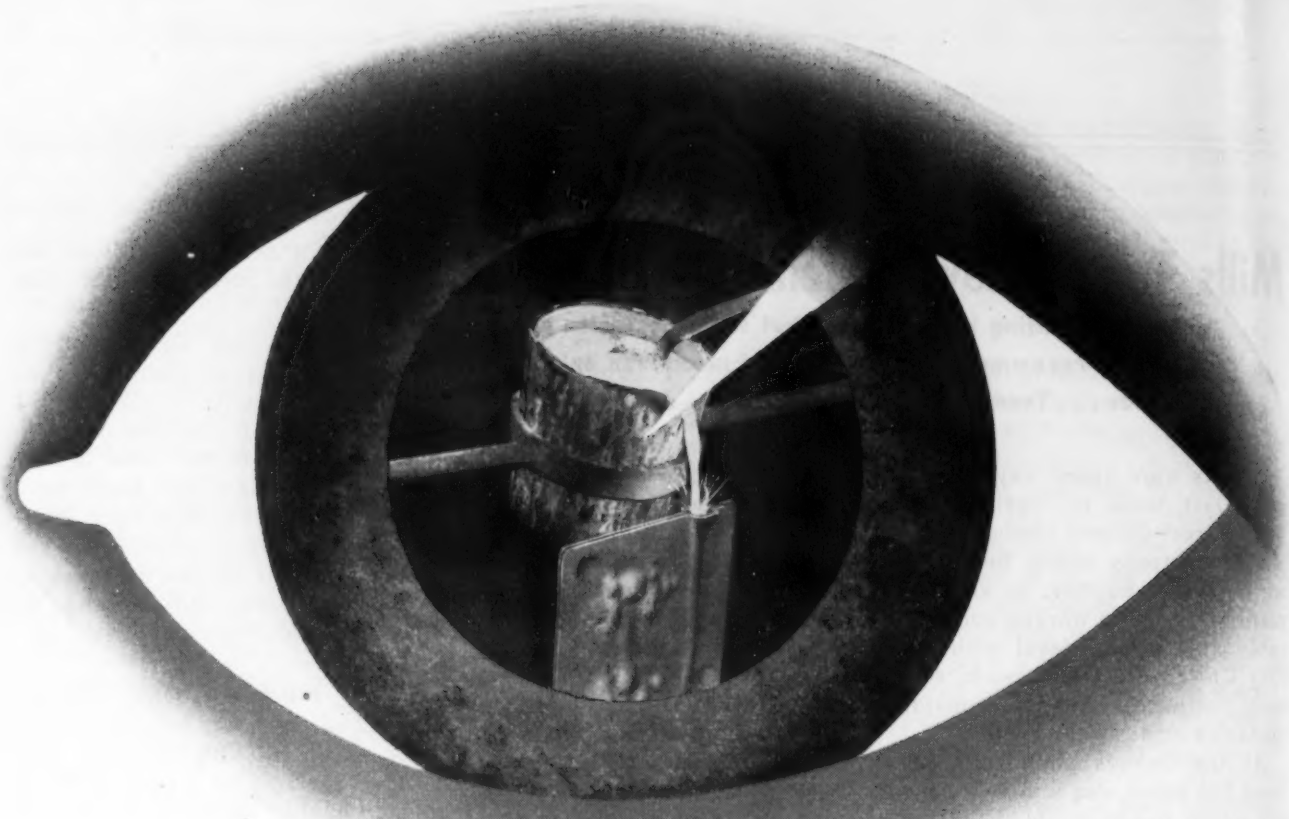
American Can Co. opened its ninth California plant with an ultimate capacity of 350 million containers per year, which represents about 50,000 tons of tinplate. New plant will boost western tin can production 6 pct. Western tinplate mills at Pittsburg and Fontana will furnish as much as possible. Deficit will be made up from the Midwest and East.

Big Billets—A main requirement of the heavy presses soon to be available (THE IRON AGE, Apr. 3, p. 85) will be large chunks of high-quality metal to be worked. The previous limit of 12-in. diam, 75S aluminum ingots has nearly been tripled by Kaiser Aluminum & Chemical Co., which can now cast them in 32-in. diam.

Achieving metallurgical soundness in these 85-in. long, 7000-lb ingots is no mean feat. Earlier attempts to make oversize slugs of this toughest commercial aluminum alloy generally resulted in cracked or ruptured ingots or reduced physical properties.

Requirements—Highest forging quality in 75S alloy is obtained by very rapid chilling and freezing of clean and well de-gassed molten metal. But the bigger the ingot the tougher the job for several reasons. Kaiser claims it has perfected freezing and de-gassing methods that result in higher metal quality in the big ingots than previously with 12-in. ingots. Even larger sizes have been hinted.

The casting of these huge ingots is now being done in an experimental unit rather than a production model. A water-cooled die is used, with ingots being removed from the bottom. Ingots are inspected for internal flaws such as cracks and porosity by an ultrasonic reflectoscope.



Seeing is believing

The eyes of the engineering world are on the Shell Mold Process . . . for in it lies the key to mass production of quality castings with superior surface finish and closely held dimensional tolerances.

The eyes of the engineering world are on Cooper Alloy . . . for once again their pioneering research has made a dream come true . . . shell mold casting of stainless steel is now a production reality!

SHELL MOLDING MEANS FASTER DELIVERY

Completely automatic molding operation substantially increases foundry productivity.

SHELL MOLDING MEANS BETTER APPEARANCE

Superior surface finish means improved appearance and clearer identification of company trademark or material.

SHELL MOLDING MEANS LESS MACHINING

Casting to closer tolerances means less metal to be removed by costly machining operations.

SHELL MOLDING MEANS LOWER COSTS

Increased productivity, reduced machining time, and close tolerance casting, means reduced costs on volume work.

THE
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FOUNDRY CO. • HILLSIDE, NEW JERSEY

LEADING PRODUCERS OF **STAINLESS STEEL** VALVES FITTINGS AND CASTINGS

Steel Strike Will Squeeze Supply Soon

U. S. shutdown will have painful effects here . . . Manufacturing cutbacks not critical yet but will worsen with time . . . Ore deliveries stop . . . Start scrap steel drive—*By F. Sanderson.*

Shutdown of the American steel industry through strike will have painful repercussions in Canada. It's the price manufacturers here must pay for their substantial reliance on a source of steel from across the border. No serious steel shortages have afflicted industry here—yet. But it is only a matter of time before the pincers squeeze supply.

So far the only company that has cut back production is Ford Co. of Canada, Windsor, which has lopped a day off operations—from 6 days to 5. But some other firms are being rocked by inventory body blows. They can carry on for another week or two before drastic layoffs become imperative.

Parts Shortage—Production in most plants dependent on imported steel and partly fabricated steel parts from the States can survive another week of strike without significant slowdown. Most plants had fairly strong steel inventories when the strike came. But unfortunately, stocks of partly fabricated parts were not so heavy. Shortages of parts will hit first and offset sounder stockpiles of steel items.

Dr. H. H. Saunderson, materials coordinator for Dept. of Defense Production, shows little optimism over steel supply to war industries. He flatly predicts curtailed production unless the American strike ends within a week or two. Even then empty supply pipelines must again be replenished. It's sure to cause difficulty here.

Dr. Saunderson said lack of a single part can hamstring a whole process. Some plants may stretch out their supplies by slowing down assembly lines.

Limit's Reached—How much assistance can be expected from hard-pressed domestic steelmakers? Not much more than is already being given. Mills here are solidly booked through the third quarter and production has been running at peak capacity.

Chief losers in the impending scramble for steel may be civilian goods producers. With a drawn-out U. S. strike, the government may divert steel to defense.

Small consolation is the fact that for the next week or two Canadian industry can coast along on present steel inventory without butting head-on into critical trouble. For when the strike ends Canada will be faced with long delays in getting fresh steel supplies from America.

No Ore Delivery—Culprit for shut-off of iron ore deliveries to big steel plants in the Hamilton area is the U. S. strike. Hamilton mills report no ore shipments have arrived for the past month. Unless time lost through the strike can be made up by ore boats before close of the Lake navigation season, iron ore may be at a premium before the end of next winter.

"What do you want now?"

What will complicate matters is imminence of greater ore demand to be exerted by new steel facilities slated to open toward the end of 1952. Practically all ore used in Hamilton steel plants comes from the U. S.

Scrap Drive—A country-wide drive for dormant scrap iron and steel is now in progress. It is sponsored by the recently-formed Canadian Scrap Iron and Steel Committee. Collectors' trucks are traveling highways and byways picking up farm "junk".

In World War II the government prohibited hoarding of scrap. Farmers were included in the order and were not to have more than 500 lb. But somehow no provision was made for collecting scrap from farms and accumulations ran from 10 to 15 tons per farm. Committees are now getting the scrap out from these farms.

Nonferrous Prices—In setting prices, Canadian base metal producers are keeping close tabs on U. S. quotations. On June 19 Canadian producers established a new price for copper at 29.5¢ Canadian funds, f.o.b. Toronto and Montreal, and a new zinc price of 14.8¢ a lb. Lead held unchanged at 14.8¢ per lb.

On June 23, lead and zinc prices were revised following changes across the line while copper held unchanged. Carload price of lead was raised 0.4¢ a lb., to 15.2¢ and zinc was reduced by 0.1¢ per lb to 14.7¢ lb. On the 24th, following the U. S. lead, Consolidated Mining & Smelting Co. of Canada upped the price for its lead one-half cent to 15.70¢ per lb.

Cash for Defense—The government proposes to spend $110,000,000 this year to aid industries handling defense contracts. The money will be used to provide capital assistance both to private and publicly-owned industries engaged in defense production.

Sales Managers Get Mousetrapped

Limited unrated tool building puts sales managers on the spot . . . Forced to show preference and can't blame it on the government . . . Cancellations, shipments up—*By G. Elwers.*

Decision to permit some production of unrated machine tools is a mixed blessing for the machine tool industry. In general it is good news, if for no other reason than as an indication of Washington's increasing awareness of the facts of life in the machine tool field.

But there are other reasons for modified war work. Many builders aren't getting enough defense business to keep going full blast. They need non-rated orders. And the industry welcomes even the limited opportunity the M-41 revision gives to get out and fight for foreign markets.

Who Needs Them?—However, news of the forthcoming amendment to M-41 is not being greeted with unrestrained enthusiasm. One drawback is that it applies only to the types of machines that are not in great demand anyway. The types that everybody wants badly will not be included.

Nightmare — The new amendment will also put the heat back on sales managers. One of them commented, "Before, when I said no to an important civilian customer, I could put the blame on the government and he couldn't get angry at me. Now, I won't be able to say yes to everybody, and I won't be able to pass the buck on the no's I'll have to give out. It's going to be a nightmare."

Already the heat is being applied. Though the amendment isn't out yet and details aren't officially available auto companies and other large buyers are pressing for position on the order books. It looks as though there will be a rough scramble for the limited non-defense production that will be available.

Backlog Chopped—The machine tool industry backlog dropped in May to less than 14 months. This of course is an industry average. Many firms still have backlogs of 20 to 30 months, while others have full order books for only a few months ahead.

New orders dropped moderately in May, to the summer level of 1950. Shipments took a big jump from index rating of 304 to a preliminary figure of 322, nearly four times the level of January 1950, and twice that of last summer.

Cancellations—Order cancellations swung up again in May, reaching the point where they neutralize about one-third of new orders received. Cancellations are a particularly irksome problem not only because of the loss of business they represent, but because of the way in which they're made.

Most of the cancellations aren't for machines in the order books, but for machines actually on the production floor. Though it is possible to find someone else who wants the machine, cancellation in that stage is troublesome and can be very expensive.

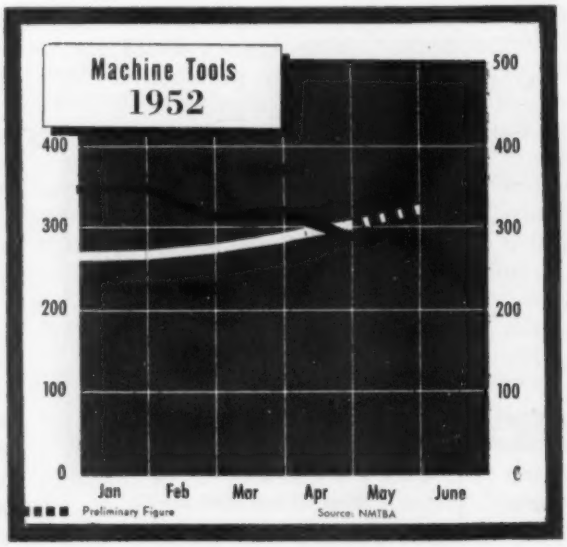
In other cases orders are not cancelled outright. Instead instructions are sent not to ship on the agreed date, but to hold the order for further directions. This complicates both scheduling and keeping order books straight.

Charge Dodgers—Another problem is that many firms try to avoid paying cancellation charges. Builders are resisting these attempts strongly. This creates more trouble but it is hard to see why builders should lose money through cancellations.

Ribbons for Radials—It is well known that in selling products like soap and cigarettes the appearance of the package is as important as the quality of the product. It is not so obvious that appearance is also an important sales factor in the machine tool field.

Most tool builders try to make their machines look attractive. But, claims one of the country's leading industrial designers, they don't try hard enough. They fail to realize how important appearance is in selling machine tools, particularly in foreign countries.

This designer believes much of the preference for foreign-built machine tools in foreign countries, is due to their sleek streamlined appearance. It may not be logical, he says, but there it is.



The Iron Age

SALUTES

Jack Kleinoder

This immigrant diemaker and his partner built a leader from small beginnings . . . Only all-around ability made it possible.

JACK KLEINODER couples in one man that rare combination of technical skill and sound administrative ability. Add to that the energy of his drive and things have to happen.

Among his achievements are significant contributions to cutting the cost of television sets to the point where they can be purchased by the average family.

But the beginning in 1934 was modest. Jack, now general manager of John Volkert Metal Stampings, Inc., formed a partnership with another diemaker, John Volkert, in that year. Jack and his associates have since built the firm into its present position as a leading independent supplier of the metal parts used in electron guns of television picture tubes. The Long Island plant also sub-contracts a variety of other radio, television and electrical parts.

Under Jack's guiding hand, Volkert engineers have redesigned several parts for more efficient and economical production. This has been a factor in reduced costs of tube assemblies and, ultimately, television sets.

Neither does Jack stick to his immediate backyard. Even the added burden of expansion and defense orders have not prevented him from continuing as a strong force in the National Tool & Die Mfrs. Association. Jack is a charter member and trustee of the organization as well as past president of the New York Tool & Die Institute.

Jack likes to see things for himself, a quality that took him to Europe recently for first-hand observation of business and living conditions there. His keen observations were widely noted.

The Iron Age INTRODUCES

W. B. McLaren, appointed vice-president in charge of industrial relations, KAISER-FRAZER CORP., Willow Run, Mich.

H. M. Oshry, named vice-president and director, CRAWFORDSVILLE FOUNDRY CO., Crawfordsville, Ind.

Paul G. Mayer, appointed assistant to the vice-president in charge of sales, HYDROPRESS, INC., New York.

Walter F. O'Connell, appointed assistant to vice-president for southern operations, OLIN INDUSTRIES, INC., New York.

J. A. Milling named executive vice-president and general manager, HOWARD W. SAMS & CO., INC., Indianapolis.

Odd H. McCleary, elected vice-president, MATHEWS CONVEYER CO., LTD., Port Hope, Ont., Canadian subsidiary of Mathews Conveyer Co.

Walter R. Grant, elected financial vice-president and treasurer, PACKARD MOTOR CAR CO., Detroit; and **Fred J. Walters,** was elected vice-president and assistant to the president. Mr. Grant succeeds **Hugh J. Ferry,** who has resigned, but will continue as chairman of the board.

A. L. Fairley, Jr., elected assistant vice-president, SHENANGO FURNACE CO., Pittsburgh.

James A. Rowan, joins GROUP ATTITUDES DEVELOPMENT CORP., New York, as chairman of the board.

D. A. Porco, Jr., appointed supervisor of sales accounting, CRUCIBLE STEEL CO. OF AMERICA, and **William W. Rinehart, Jr.,** becomes works controller, Midland Works, Pa.

Cecil T. Goodwill, appointed executive vice-president, BARRY STEEL CORP., Detroit.

H. K. Johnson, named controller, E. W. BLISS CO., Canton, Ohio.

Howell G. Evans, elected senior vice-president, HAMILTON MFG. CO., Two Rivers, Wis.; **R. G. Halvorsen,** becomes vice-president in charge of sales; and **C. S. O'Neil,** elected vice-president in charge of research.

Dean Stockett Edmonds, elected to the board of directors, FLEXIBLE TUBING CORP., New York.

Paul J. Allwein, appointed assistant to the works manager, THE PIVOT PUNCH & DIE CORP., North Tonawanda, New York; and **James G. Deckert,** appointed assistant to the controller.

R. C. Rudolf, elected assistant secretary, UNIVERSAL-CYCLOPS STEEL CORP., Bridgeville, Pa., and **E. J. Reagan,** appointed manager, stainless bar and wire sales.

Raymond T. Fenn, named chief engineer, STERLING ENGINEERING CORP., Winsted, Conn.

Jacob Vandenberg and **John S. Holland** join staff, mining department, NATIONAL LEAD CO., New York.

W. R. Riggs, promoted to manager in charge of general services, SINCLAIR RESEARCH LABORATORIES, INC., Harvey, Ill.

L. G. Johnson, joins sales staff in charge of sales of steel tubular goods, LONE STAR STEEL CO., Dallas.

Fitz L. Sargeant, appointed regional general manager, South Central Region Sales office, REYNOLDS METALS, CO., Louisville.

R. L. HESS, JR., elected a vice-president, The Rust Engineering Co., Pittsburgh.

B. A. GUSTAFSON, appointed vice-president, Sundstrand Machine Tool Co., Rockford, Ill.

WILLIAM P. DUDLEY, elected vice-president in charge of production, The Ohio Steel Foundry Co., Lima and Springfield plants.

Personnel

Continued

S. James Aires, Jr., named manager, Commercial Research, Market Development Dept., LUKENS STEEL CO., Coatesville, Pa.

James A. Stavrolakis, joins staff as a supervisor in the Ceramics & Minerals Dept., ARMOUR RESEARCH FOUNDATION.

Adair Morrison, joins staff as assistant to the science director, ARTHUR D. LITTLE, INC., Cambridge, Mass.

Philip A. Blair, appointed assistant sales manager, fastener division, HOBBS MFG. CO., Worcester, and **George R. Clay,** promoted to sales manager, machine division.

A. R. Van Vorst, appointed assistant manager, tube and extrusion sales, ALUMINUM CO. OF AMERICA, Pittsburgh.

Carl T. Blumenschein, appointed purchasing agent, THE GENERAL FIREPROOFING CO., Youngstown, Ohio.

R. P. Powers, appointed general manufacturing manager, Lincoln-Mercury Div., FORD MOTOR CO., Detroit.

Edward C. Eizember, appointed superintendent of the Peerless plant, THE WELLMAN BRONZE & ALUMINUM CO., Cleveland; **Robert A. Thomas,** manages new Garfield plant, and **Benjamin E. Weimer,** will direct customer relations.

David S. Lewis, appointed manager, Newark Warehouse, STAINLESS SALES CORP., New York.

Charles G. Grossland, named purchasing agent, GREENVILLE STEEL CAR CO., Greenville, Pa.

M. L. Johnson, promoted to division credit manager, Gulf Coast Div., THE NATIONAL SUPPLY CO., Pittsburgh.

Walter L. Connell, promoted to regional manager, THE AMERICAN PULLEY CO., Philadelphia; **Gail E. Cogan,** appointed district manager, Minneapolis territory; and **Robert E. Kochs,** appointed district manager, Rochester territory.

Roy S. Campbell, named deputy project manager, F. H. McGRAW & CO., Paducah, Kentucky, atomic energy plant.

FREDERICK J. HILSINGER, named assistant controller and head of Operations & Sales Acctg. Dept., Crucible Steel Co. Of America.

AUSTIN E. COLE, elected vice-president and treasurer, Illinois Tool Works, Chicago.

WILLIS J. KEENAN, named vice-president and general manager, Woodhouse Chain Works, Trenton.

CARL A. SALMONSEN, named acting general manager, Control Dept., General Electric Co., Schenectady.

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Personnel

Continued

Rufus B. Jones, appointed industry service director, TRAILMOBILE INC., a subsidiary of Pullman Inc.; **Joseph O. Young,** named general operations manager; and **Harry E. Eyler,** appointed general sales manager.

H. C. Bughman, Jr., elected chairman of the board, UNION SPRING MFG. CO., New Kensington, Pa., **W. F. McCabe,** elected president, and **Clarence Abitz,** appointed vice-president.

C. E. Bates, appointed assistant manager, Tin Plate Sales Div., in charge of Metal Decorating, WHEELING STEEL CORP., Pittsburgh.

Fred R. Haeuser, Jr., appointed regional representative, Industrial Sales, New Orleans Office, REYNOLDS METALS CO., Louisville, and **Hal N. Logsdon,** appointed industrial markets sales manager, Eastern region.

William C. Miller, promoted to sales representative, Chicago area, ROYAL METAL MFG. CO.

Joseph A. Rosa, appointed manager of Forging Sales, BUREE STEEL CO., INC., Rochester.

Ed Schmid, Jr., appointed director of public relations and publicity, RESERVE MINING CO.

OBITUARIES

Robert MacArthur, president, Ramsey Chain Co., Inc., Albany.

William J. Wardell, 64, a vice-president and director, American Can Co., recently in New York City.

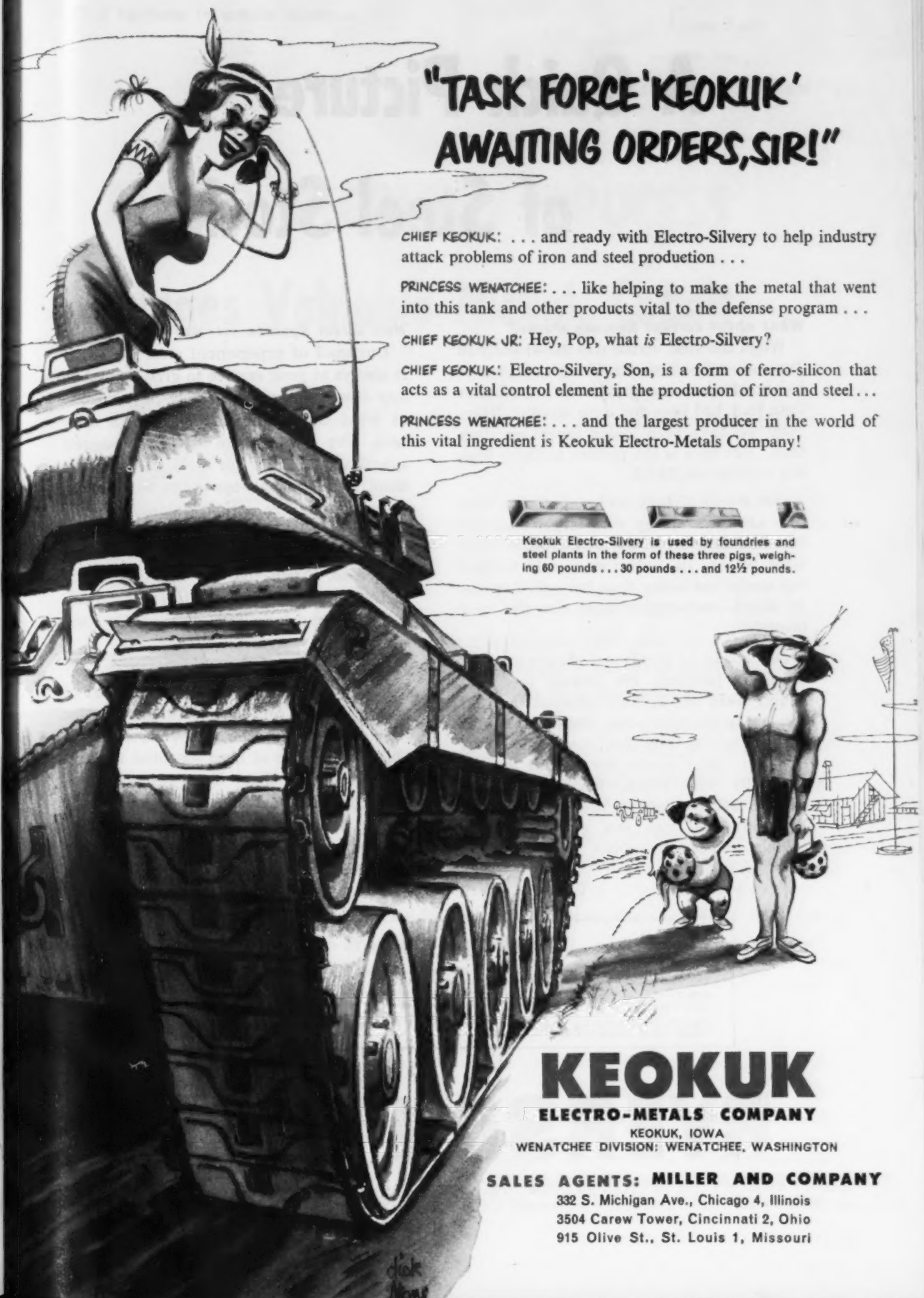
Frank L. Harris, chief draftsman, Engineering Dept., C. H. Wheeler Mfg. Co., Philadelphia.

Joseph M. Coppinger, 60, general purchasing agent, International Minerals & Chemical Corp.

Forest J. Smith, 57, assistant to general superintendent, Fairless Works United States Steel Corp.

John C. Reed, 50, vice-president, research, American Radiator & Standard Sanitary Corp., recently in Louisville.

George W. Eppler, 55, general manager, Monongahela Div., Combustion Engineering Superheater, Inc., New York.



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CHIEF KEOKUK: . . . and ready with Electro-Silvery to help industry attack problems of iron and steel production . . .

PRINCESS WENATCHEE: . . . like helping to make the metal that went into this tank and other products vital to the defense program . . .

CHIEF KEOKUK JR: Hey, Pop, what *is* Electro-Silvery?

CHIEF KEOKUK: Electro-Silvery, Son, is a form of ferro-silicon that acts as a vital control element in the production of iron and steel . . .

PRINCESS WENATCHEE: . . . and the largest producer in the world of this vital ingredient is Keokuk Electro-Metals Company!

Keokuk Electro-Silvery is used by foundries and steel plants in the form of these three pigs, weighing 60 pounds . . . 30 pounds . . . and 12½ pounds.

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SALES AGENTS: MILLER AND COMPANY

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3504 Carew Tower, Cincinnati 2, Ohio

915 Olive St., St. Louis 1, Missouri

A Quick Picture of Steel Stocks

What about current Ryerson stocks?

When the steel strike was called early in June our over-all stocks, though still out of balance from a size standpoint, were better than they had been for some months. Naturally we have been losing inventory since then. But here is the picture as these lines are written—6/25/52.

Our stocks of both carbon and alloy steel bars are quite spotty with larger diameter bars in short supply, the smaller sizes somewhat better. In carbon steel, cold finished bar stocks are better than hot rolled stocks. In alloys, carburizing types are the most plentiful.

Our stocks of plates and shapes are low, as these products are among the most widely used for defense applications, but we can meet most any requirement for *welded tubing* and for *straight chrome stainless*. And *sheets* are in fair supply, especially cold rolled, heavier than 19 gauge. Other products in good supply at Ryerson: *drill rod, tool steel, hydraulic tubing, structural tubing, Inland 4-Way Safety Plate.*

How about Ryerson service?

Our staff of experienced steel specialists is always at your service to give counsel on any steel problem. You may be surprised at what can be accomplished with their help. For example, we can often suggest practical alternates for steel that's not on hand. And if you always tell us what length or width you are actually using, we may sometimes be able to fill your order from smaller pieces when we could not handle it otherwise. Then too, we are continually adding to our service facilities; so you can depend on quick delivery of available steel.

What about the future?

With reasonable restraint on the part of steel users and conformance to government regulations during the strike, we should be able to take care of most essential requirements for some time. Upon resumption of steel production, we will replenish our stocks as rapidly as possible. Meanwhile, you may be sure we'll do our best to help whenever you call.

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CARBON STEEL BARS — Hot rolled and cold finished.
STRUCTURAL — Channels, angles, beams, etc.
PLATES—Many types including Inland 4-Way Safety Plate.
SHEETS—Hot and cold rolled, many types and coatings.
TUBING—Seamless and welded, mechanical and boiler tubes.
ALLOYS—Hot rolled, cold finished, heat treated. Also tool steel.
STAINLESS—Allegheny bars, plates, sheets, tubes, etc.
BABBIT—Five types, also Ryertex plastic bearings.
MACHINERY & TOOLS — For metal fabrication.

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Find fortune in waste dump—

The Iron Age
FOUNDED 1855
Technical Articles

ALNICO RECOVERY PROCESS

Salvages Valuable Nickel, Cobalt

By Arant H. Sherman
Vice President
Alter Co.
Davenport, Iowa
and

Marvin Pesses
Chief Metallurgist

A practical method of recovering nickel, cobalt and copper from the waste dumps of Alnico magnet manufacturers promises to pay off handsomely in lower costs. These wastes—metal particles in a highly refractory slag, or grindings mixed with water or oil and abrasive particles—have long resisted attempts at recovery. Cleaned, dried grindings and crushings are magnetically sorted, then reblended to correct proportions. Aluminum is added as a deoxidizer. Silica and sodium silicate are added to produce a marketable slag. The mix is melted. Just before pouring iron oxide is added to remove excess carbon and silicon. Heats of 3000 to 4000 lb are poured as shot or ingot and shipped to magnet makers. Production, in pilot stage now, is expected to be in full swing in 3 months using induction furnaces.

The first attempt to reclaim and refine nickel, cobalt and copper from the drosses and residues resulting from the production of Alnico permanent magnets began at Alter in 1949. Since then, considerable research and experimental work has resulted in a process for which a patent has been applied for. The process, practical economically and metallurgically, is still in the pilot plant stage. Full scale production however will be under way within 3 months.

Manufacturers of permanent magnets have long discarded their grindings and skimmings in slag dumps for lack of any better outlet for the complex alloy contained. While a very small percentage has been used up by the ceramic coloring industry, no wide-scale use was ever

"Approximately 20 pct of the magnet alloys are lost in the form of skimmings or grindings . . . "

found for the residue metals produced by the magnet industry.

An attempt was made to find a useful outlet for this material. No other industry was able to absorb the particular alloys of nickel, copper, cobalt, aluminum and iron in the proportions used by magnet manufacturers. Apparently the best use that this metal could be put to, would be re-use by the permanent magnet industry.

Alter Co. began experimental work to find a satisfactory, economically feasible method of refining these waste drosses and residue.

The complex nature of the alloys involved meant that suitable furnaces had to be designed to conduct experimental work. Certain processing machinery had to be set up to prepare the material for the smelting and refining process.

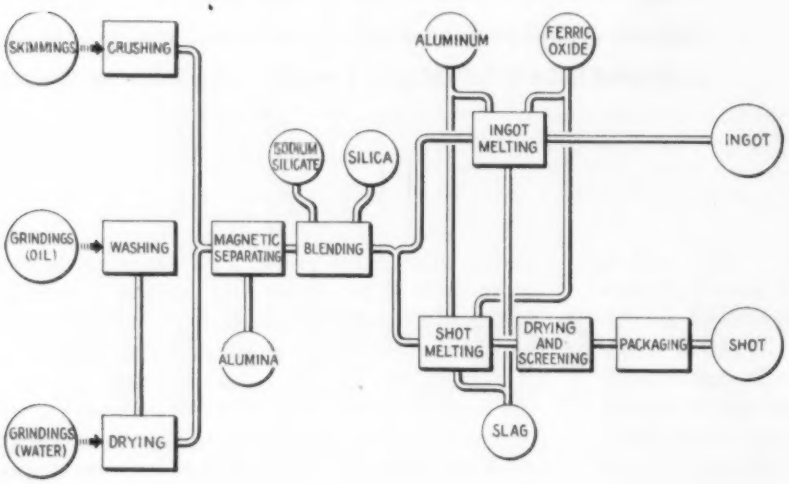
The slag and residue consist of three totally different types of material. The first is Alnico skimmings, made up of metallic particles encased in a highly refractory alumina slag. The second material is a by-product of final grinding in magnet manufacture. This material consists of fine metallic particles, along with a great quantity of oil and abrasives, much of which is alumina. The third material is similar to the second, except that the oil in the grinding operation is replaced by water. In order to procure experimental quantities of material, arrangements were made with manufacturers of permanent magnets who were able to supply quantities of slag and grindings necessary for experimental operation. Such a reclamation project in dollars and cents offer a tremendous advantage to the manufacturers of permanent magnets. Approximately 20 pct of the magnet alloys are lost in the form of skimmings and grindings. Thus, if 1 million lb of Alnico metal were melted by a consumer during a month's run, 200,000 lb of unreclaimed drosses and residue would be lost for all practical purposes. This 200,000 lb of metal represents 30,000 lb of nickel, 50,000 of cobalt, 6000 lb of copper, and 98,000 lb of iron. The aluminum content cannot be considered inasmuch as the aluminum left in the drosses is in the form of oxides, or otherwise is unreclaimable.

Preliminary investigation indicated Alnico drosses and residue could not be melted in the state in which they were found. In order to make such investigation a 500 lb tilting crucible furnace was devised in which twin oil burners of special design were used. The burners are tangentially fired into the furnace and employ a special high pressure jet nozzle. Available crucibles, with average life from ½ to 4 heats, were unsatisfactory. Electro-Refractories Corp. designed special crucibles for this experimental furnace which proved satisfactory for initial experimental melting.

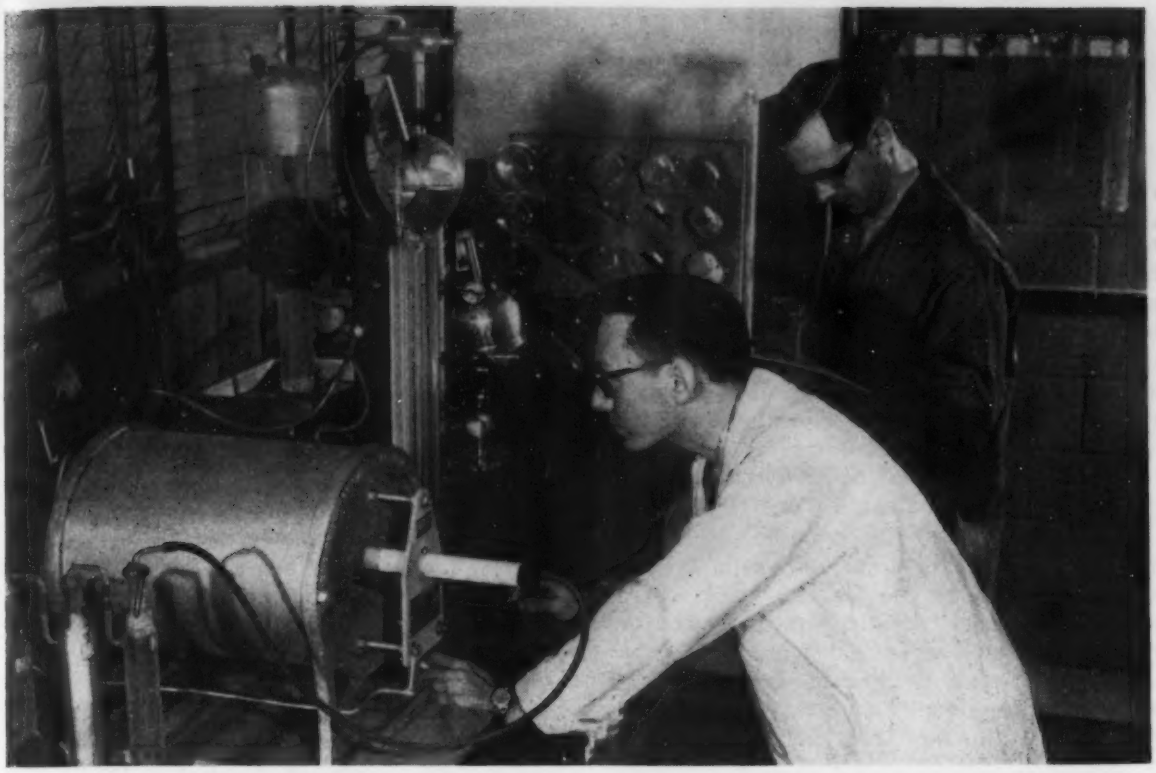
Experimental crucible furnaces tried

The first experimental crucible furnaces proved that after proper preparation a refining process of Alnico metal was possible, but a practical and economical practice was still far in the future. Initial experimental smelting indicated, however, that the aluminum was non-reclaimable while the cobalt, iron, nickel, and copper could be reclaimed and a low carbon content metal could be produced, even using oily grindings.

From the initial crucible furnace, many changes of design and several experimental models finally resulted in the ultimate use of a rotary, reverberatory, non-crucible oil fired furnace, having a hot metal capacity of 4000 lb. All furnaces were designed by Alter's engineering department and changes were made from time to time which were consistent with the results and experimental data compiled. The first attempt with reverberatory non-crucible melting was a tilting reverberatory furnace. This was found unsatisfactory, however, due to the great



SCHEMATIC layout shows steps in recovery of permanent magnet metals normally lost as waste grindings and skimmings.



CAREFUL CONTROL of materials in the mix is important. Carbon content is automatically determined with this unit.

loss of heat, extreme viscosity of the metal, and the highly refractory nature of the slag.

A rotary reverberatory furnace now in operation has been found most satisfactory of the oil fired furnaces used to date. This furnace permits the tapping of heats from 3000 lb to 4000 lb. The refined material material is highly satisfactory and completely acceptable for the most exacting specifications of permanent magnet manufacturers. At present the company is installing 2 high-frequency Ajax Northrup electric-induction furnaces, which proved to be the most satisfactory for our particular type of melting operation. Full scale production will ultimately be maintained in these furnaces.

The three separate types of dross each require

ALNICO SKIMMINGS and grindings shown in pile at right will yield pig magnet metal equal to stack at left.

"Ingot or shot is shipped to permanent magnet manufacturers for remelting . . ."

preliminary processing and special treatment prior to being run together through the magnetic separator, as shown in the flow sheet. Skimmings received are crushed, while Alnico wet grindings only require a special detergent bath, prior to being dried. All through the processing, and as far back as the mill, all attempts are made to keep each of the varieties of Alnico separated. After many experiments performed in co-operation with manufacturers of mining and separating equipment, a double-belt separator with a variable field strength was evolved.

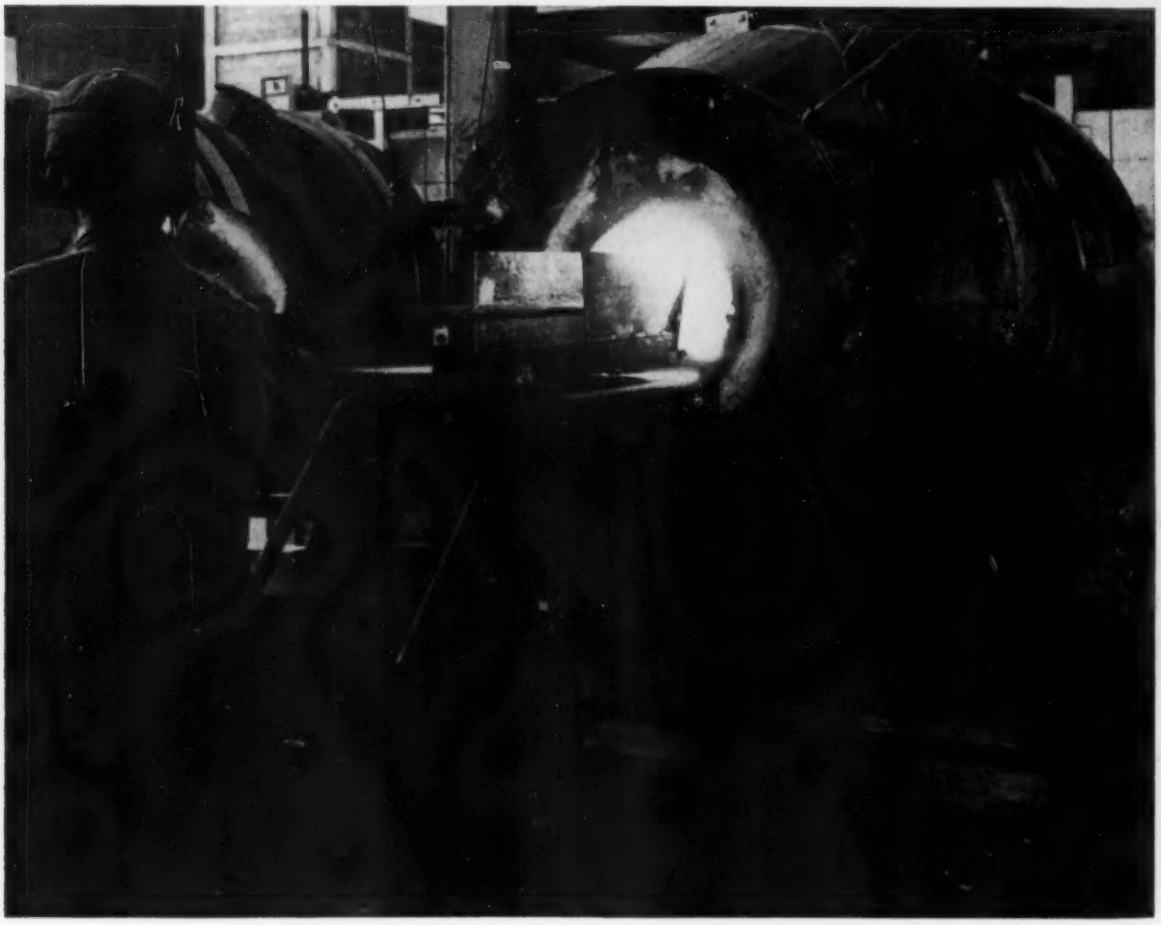
Prior to the blending operation, the skimmings are analyzed and calculations of the additions are made by the laboratory. These are added to the finely divided skimmings and/or grindings in the blender. Sufficient aluminum is added to act as a de-oxidizing agent, and to leave enough residual aluminum in final products to meet alloy specifications. The quantity of silica and sodium silicate is determined by the amount of aluminum oxide in the skimmings, plus that quantity produced by oxidation of the aluminum added. This quantity of silica and sodium silicate is calculated so as to make a slag having the approximate composition of the mineral albite. In full production, this by-product, albite, which contains traces of metallic oxides, will be of commercial value in the ceramic industry, both as a flux and colorant in glazes. Iron oxide is added as an oxidizing agent and to eliminate excess carbon.

After the material has passed through the blender and all flux media and the oxidizing and de-oxidizing agents are added, the material is charged into the furnace. A 4000 lb heat of metal is brought up to a temperature of 3000° to 3300°F. In no instance is the furnace temperature allowed to exceed 3500°F.

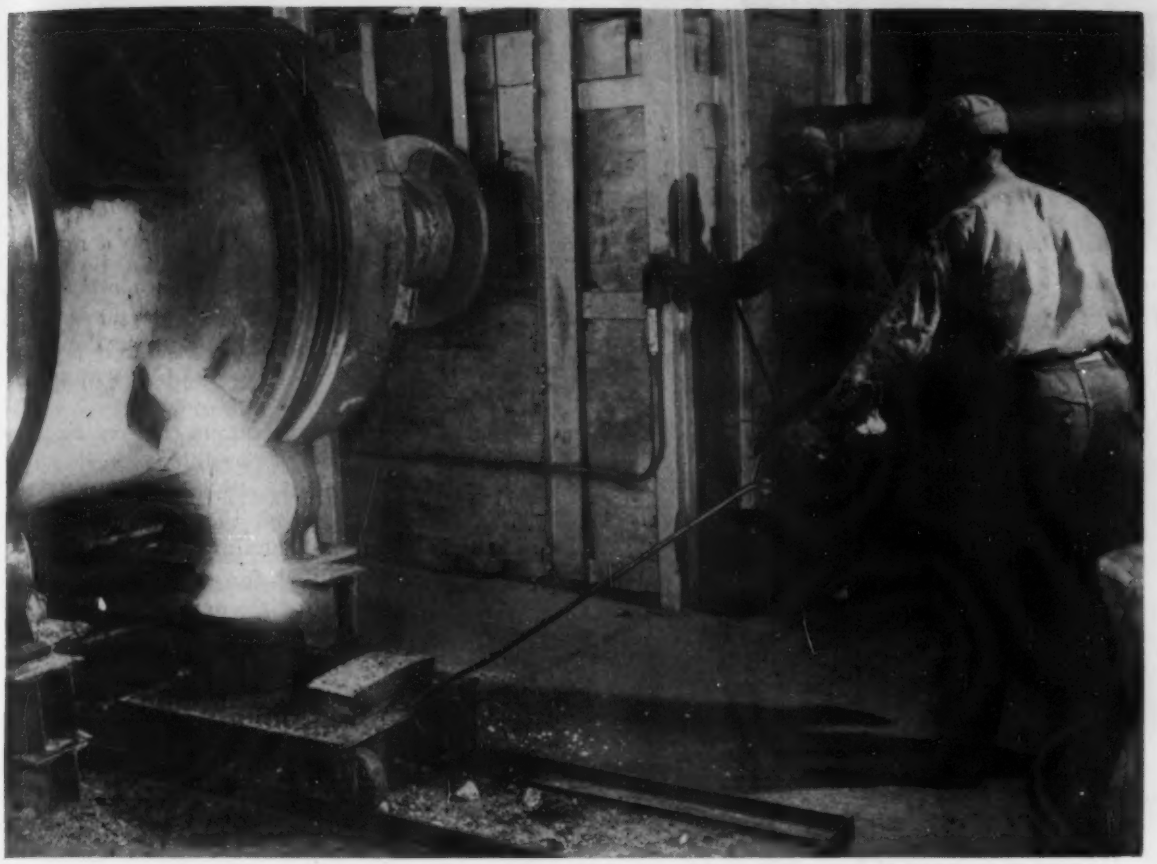
After 6 hr in the furnace, the first aluminum addition is made. This reacts with the oxides of nickel, cobalt and iron present in the melt, and forms an aluminothermic reaction which reduces the oxides. When the reaction is complete an excess of aluminum is added to bring the metal up to specifications. Immediately prior to pouring off the heat of metal, sufficient iron oxide is added to lower the carbon and silicon content of the bath. The bath is now ready to be poured into shot or ingot form.

The ingot or shot is shipped to permanent magnet manufacturers for remelting and the cycle is completed.

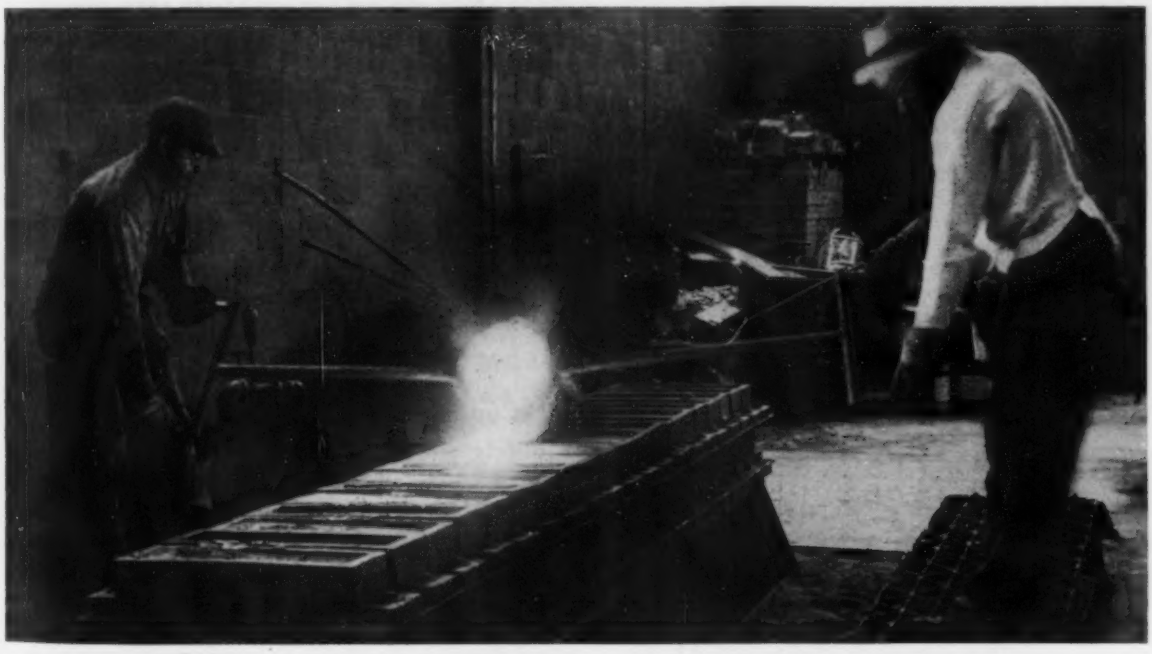
The economic advantage in recovering these



DROSS OF MAGNET manufacture is charged into rotary furnace. Inconel charging chute withstands high temperatures.



MOLTEN METAL is poured into ladle from 4000-lb rotary furnace. Temperature is held between 3000° and 3300°F.



HEAT OF METAL is poured into molds for resale as ingots. Metal is also made into shot. Magnet makers buy product.

metals is not only in the conservation of vital metals, such as nickel, cobalt, and copper, but also the fact that the virgin metals used represent a cost to the consumer of approximately 73¢ per lb. The reclaimed metal, when returned to the magnet manufacturer, only costs 1/3 this amount. After the recovery and re-processing is put into full scale production, material from current production will be processed, and also material which has accumulated in dumps over a period of many years will be re-processed. This, in effect, will save millions of pounds of vitally needed virgin metals, which can be put to other defense important industrial applications.

Tough alloy steels SUCCESSFULLY HOT EXTRUDED

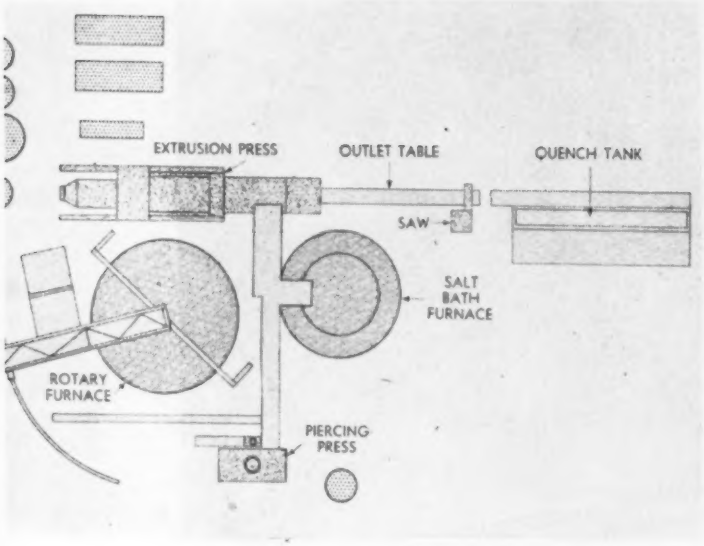


FIG. 1—Layout of equipment at Beaver Falls plant for production of high alloy tubes and solids by hot extrusion.

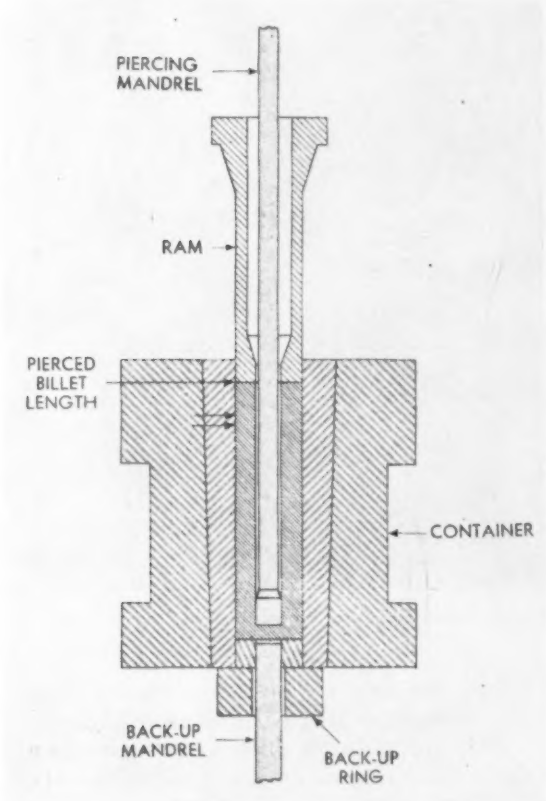


FIG. 2—Piercing press shows mandrel almost through billet. As backup mandrel moves out piercing is completed.

Billets and tubes of stainless, high alloy and high melting point steels are being successfully extruded in a production setup by Tubular Products Div., Babcock & Wilcox Co., using the Ugine-Sejournet hot extrusion process.

Glass, used as a lubricant, is the key to the process which has made possible extrusion of Croloys 18-8S (Type 304), 18-8STI (Type 321), 25-20 (Type 310), 16-13-3 (Type 316), Croloy 27 (Type 446), molybdenum and titanium.

Glass was substituted for the graphite and carbon containing materials previously used as a lubricant. The glass, melting on contact with the hot steel, prevents seizing of the billet and tools, and insulates the tools from the heat of the billet. Friction is reduced and billet length increased. Carburization resulting from use of graphite has been eliminated.

Layout of equipment at Beaver Falls, Pa., for production of tubular or solid shapes is shown in Fig. 1. Billets are charged into a 23 ft diam rotary hearth gas fired furnace. Heating capacity is 5 tons of steel per hour from room temperature of 2250°F. After heating, if they are to be made into tubing, billets are rolled across a glass-pickup table to the piercing operation and go directly to the salt bath furnace.

Piercing is done with glass between billet and piercing mandrel and, depending on analysis, with or without glass between container and billet. Piercing consists of pre-combustion, and piercing to within an inch of the cylinder-bottom which is closed by a back-up mandrel, Fig. 2. Piercing is completed when the back-up mandrel retreats.

Picks up fiberglass mat

Billets, pierced or unpierced, are charged into metal baskets which support them in a rotary salt bath furnace, Fig. 3. A hook and drum device lower the basket onto a carrousel support. A cam-type surface on the drum rotates the carrousel forward and indexes the next basket into position to be lifted from the bath. After circling through the furnace, the basket is lifted out by the drum and the billet discharged into a trough on a transfer car. The furnace is rated at 5 tons of steel per hour from 1600° to 2250°F.

An inclined surface on the transfer car is covered with a fiberglass mat. As the car travels toward the extrusion press, the billet is raised out of the trough and rolled down the inclined plane fusing to the fiberglass mat and picking it up, Fig. 4. The billet rolls into a trough at the

front of the car which lines up with the container bore and moves into the die container.

Extrusion takes place in from 2 to 4 sec, yielding a piece 20 to 60 ft long depending on billet size and section area. Tubing may be cut into shorter lengths on a hot saw and either quenched or rolled onto a cooling bed.

The 500-ton vertical piercing press has containers ranging up to 8 in. in diam. Press stroke is 34 in. After piercing, the container can be shifted either under the piercing cylinder or out over a stripping cylinder where the pierced billet is pushed out.

In extruding tubing, a hollow billet is confined in a container between the ram of the press and the die. From the ram is a mandrel which passes through the billet and the die. As the ram moves forward, Fig. 5, metal is squeezed out between die and mandrel.

Although a hollow may be produced by forcing the extrusion mandrel through it prior to extrusion in the same press, the method is limited by mandrel strength and stiffness. Separate piercing permits greater concentricity of the final tube. Tube concentricity depends on concentricity of the pierced billet prior to extrusion.

Handles billets to 8 in.

Using a separate press, a slightly oversized hole is pierced. This permits use of a larger and stiffer mandrel and less mandrel wander results at the far end of the pierced billet. The press compresses the billet to fill the container. This prevents eccentric piercing resulting from the billet lying off to one side of the container. First end of the billet pierced is placed in the extrusion press farthest from the ram during extrusion. Convergence of concentric metal tends to hold the flexible mandrel on center.

The 2500-ton extrusion press containers handle up to 8-in. billets. Main ram stroke is 100 in. A 28-in. billet can be placed in front of the container before start of the stroke. Fast extrusion stroke minimizes tool heating. The press is designed with a prefill speed of 21 ips and a possible power stroke speed of 6 ips. The press operates on 3600 psi-water.

The rotary salt bath furnace is powered by six 150-kw, 3-phase transformers and has automatic temperature control. Salt bath heating provides billets as nearly scale free as possible.

Production of seamless tubing and solid shapes from the more refractory stainless steels and the highly alloyed and high melting point metals will be possible with the method. The process is adaptable for stainless bearing steels, and many high nickel or high chromium compositions not successfully produced by rotary piercing methods. It may also be applied to the acid-resisting alloys, tool steels, molybdenum metal, vanadium, titanium and zirconium.

The method produces a tube free from the breaks found on a rotary pierced tube. High

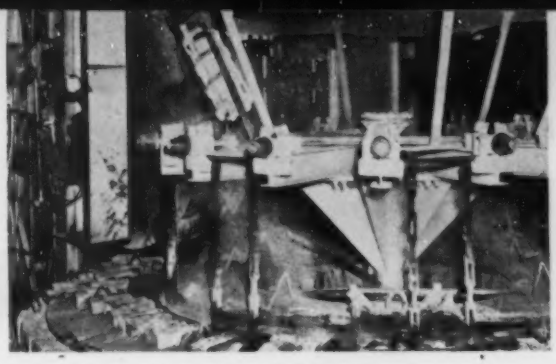


FIG. 3—Drum with hook drops billet (in basket) into rotary salt bath. Drum indexes carrousel, picks up heated billets.

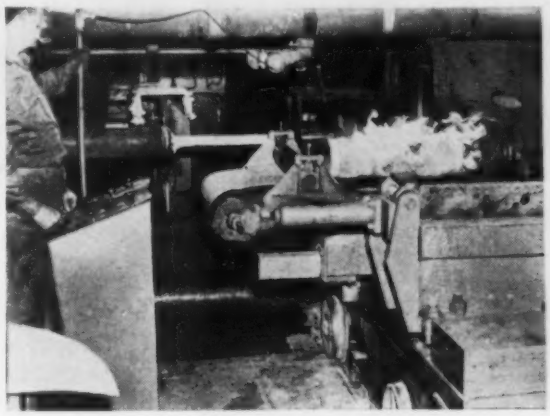


FIG. 4—Billet rolls down inclined plane of transfer car, and picks up fiberglass mat, moves on to press.

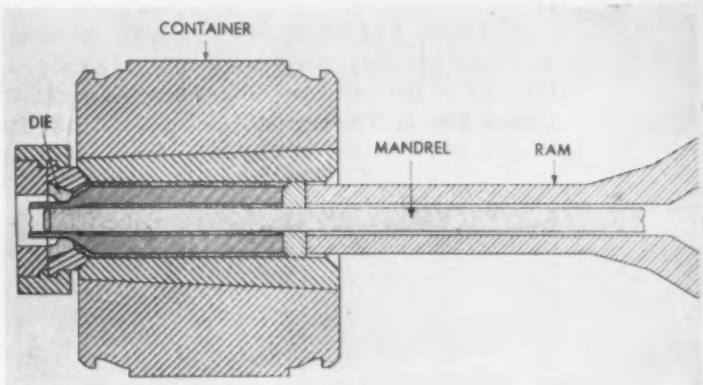


FIG. 5—As ram of 2500-ton extrusion press moves forward, metal is squeezed out between die and mandrel.

alloy tubes can be produced faster, per man hour, than by rotary piercing. Extruded products require almost no grinding on the outside surface, and internal surface has been so good that no work need be done, even on requirements for redrawing. This has eliminated better than 50 pct in the work and material previously lost in grinding out surface defects.

Production of small light wall tube by extrusion will eliminate half the cold-work passes, yet leave enough cold-working to assure the surface and mechanical characteristics of a cold-worked tube.

For stainless steels, production per man hour will exceed the rotary piercer rolling mill-reeler set-up with a rotary furnace producing a similar range of sizes by about 30 pct.

Fine finish faster—

MECHANICAL HANDLING

Ashtabula Bow Socket Co. took the guesswork out of its cleaning and painting problems by installing a parts conveyer system in its finishing department. Maximum mechanical handling gave high efficiency plus top use of space. The overhead chain and rail conveyer carries auto and bicycle parts from machining and subassembly points to the degreasing tunnel, treating baths, painting and baking. An unusual cooling tower improves quality of paint by preventing automatic setup of paint on a hot surface. A still cleans degreasing fluid.

Convertible folding top sets and bicycle parts must have a durable as well as attractive finish—to please customers visually and to withstand weather and handling. Several years ago Ashtabula Bow Socket Co., Ashtabula, O., installed efficient cleaning and painting facilities to do just that job on parts used in auto and bicycle assemblies.

From the press shop, sub-assembly benches and some grinding operations, parts are conveyed through a Detrex vapor and spray degreasing tunnel, Fig. 1. The tunnel is about 4 x 6 x 32 ft in size, with travel speed about 2 ft 8 in. per minute. Pieces are 180°F when they leave the tunnel. At one end of the degreaser is a 150 gal still, Fig. 2, which processes the trichlorethylene used in degreasing at the rate of 50 gay per hr. This insures a better quality cleaning, removing all oil and silt from the chemical bath, which is replenished as needed.

From the degreaser the 200 ft conveyor moves parts a short distance and dips to a Parkerizing tank, Fig. 3, about 2 x 4 x 24 ft. Hooks are used at the side of tank as hangers for steam-

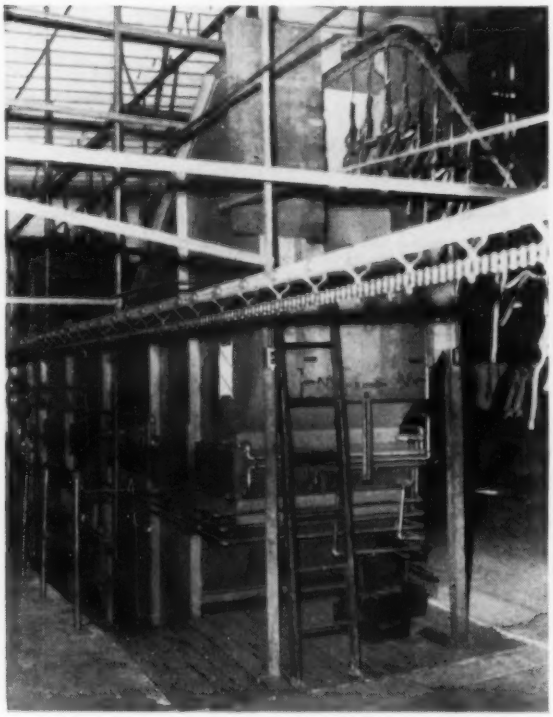


FIG. 1—Degreasing tunnel is first operation in cleaning department as parts come from machining and subassembly.

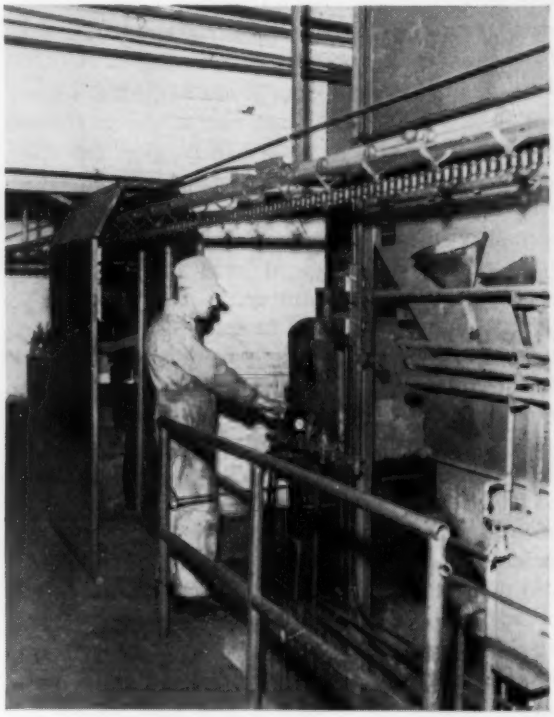


FIG. 2—Still, at end of degreasing tunnel, removes oil and silt from trichlorethylene at rate of 50 gal per hour.

Simplifies parts finishing

heating coils, permitting easy removal for cleaning purposes. Fumes are removed via ducts installed along edge of tank. After leaving the Parkerizing bath, parts continue through the hot water rinse and chromic acid bath tanks, Fig. 4. Pieces emerge at a temperature of about 180°F. They are hand-brushed before proceeding to priming to eliminate rough qualities of paint due to uneven phosphatizing.

From the cleaning conveyer, pieces are transferred to another conveyer 340 ft long which carries them to dip or spray painting. Spray painting is used if recesses in parts make dip drainage impractical. This dip tank, Fig. 5, with oil base primer, has an air-powered agitator and two overhead fire extinguishers. A caster wheel base permits the tank to be moved to one side while another dip color is used.

From priming, parts move, at about 26 ipm, through the first of two Fostoria infra-red baking ovens. The 20 ft long oven heats pieces to 275° to 300°F, Fig. 6. Adjustments in temperature and speed, normally 2 ft 2 in. per minute, are made depending upon parts being processed.

Parts are cooled in an unusual sheetmetal cool-

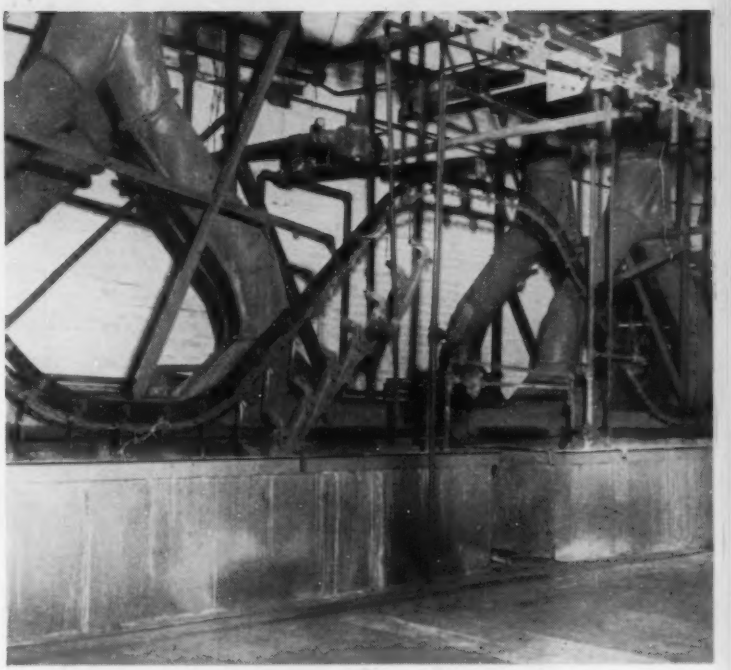


FIG. 4—Hot water rinse and chromic acid baths follow Parkerizing. Pieces leave here at temperature of about 180°F. Parts are hand brushed before priming.

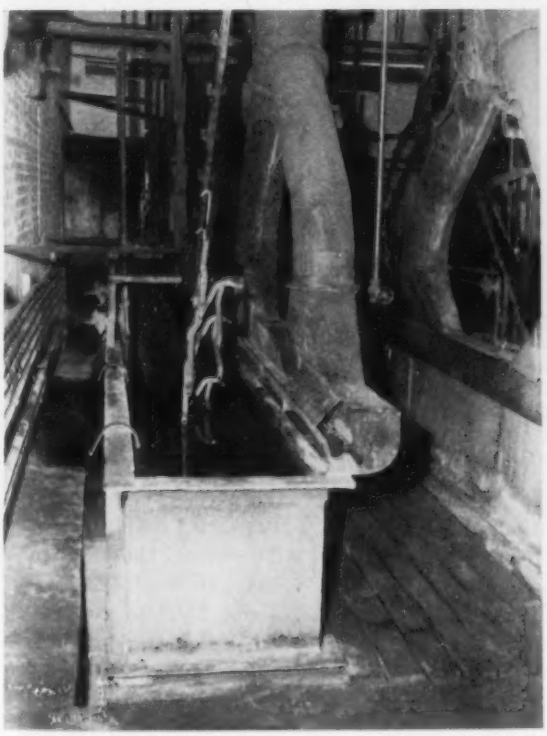


FIG. 3—Parkerizing tank is short hop from degreasing unit. Hangers for heating coils permit easy removal for cleaning.

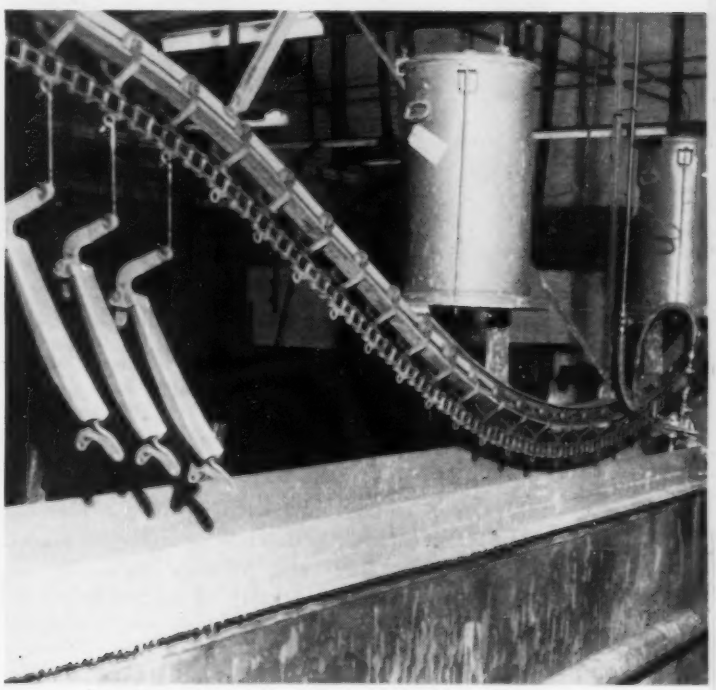


FIG. 5—Parts are transferred from cleaning to painting conveyer for dipping. Spray is used where parts drain poorly.

"Cooling process improves quality of the final coat of paint by preventing automatic setup . . ."

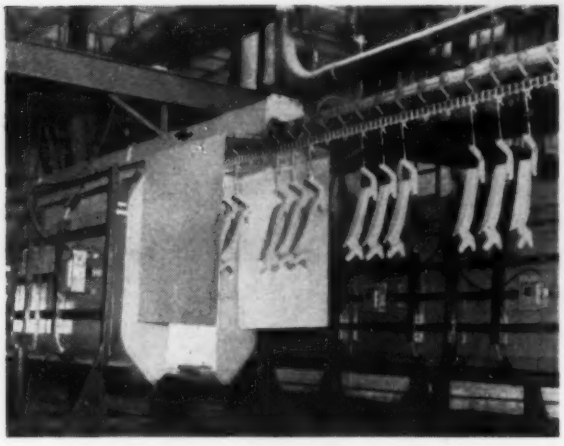


FIG. 6—Priming coat is baked on trip through first of two infra-red baking ovens. Parts are heated to 275° to 300°F.

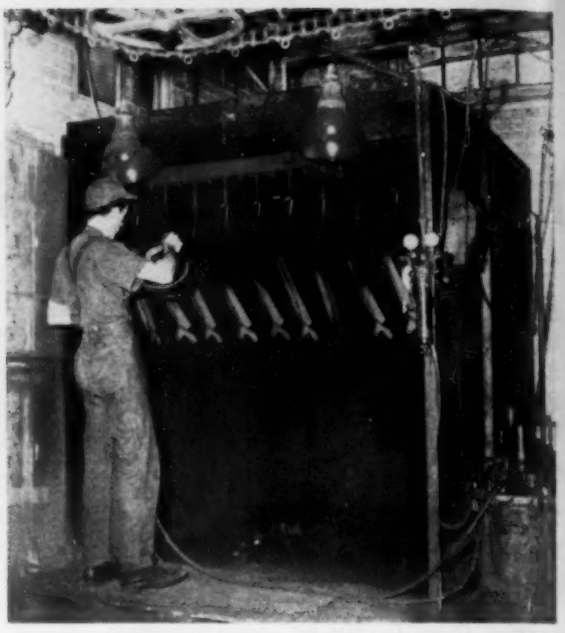


FIG. 8—Convertible linkage is sprayed with enamel, rebaked. Cooling tower, Fig. 7, prevented premature setup of paint.

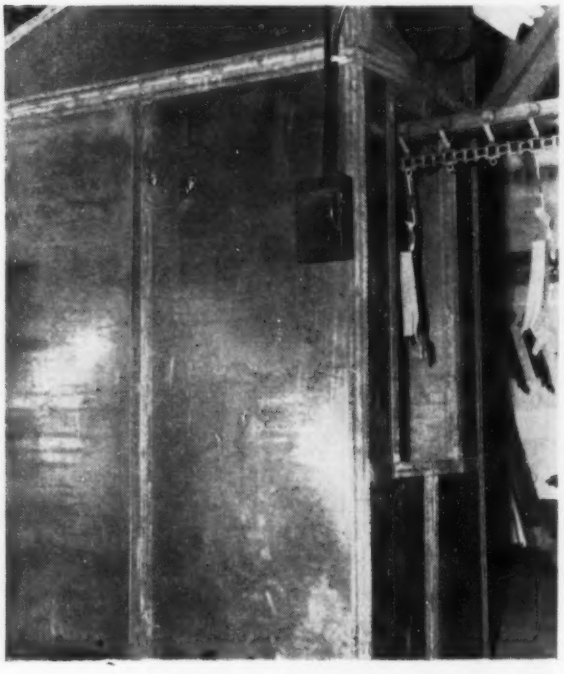


FIG. 7—Parts lose heat fast in unusual sheetmetal cooling tower. Pieces cool to about 100°F before final painting.

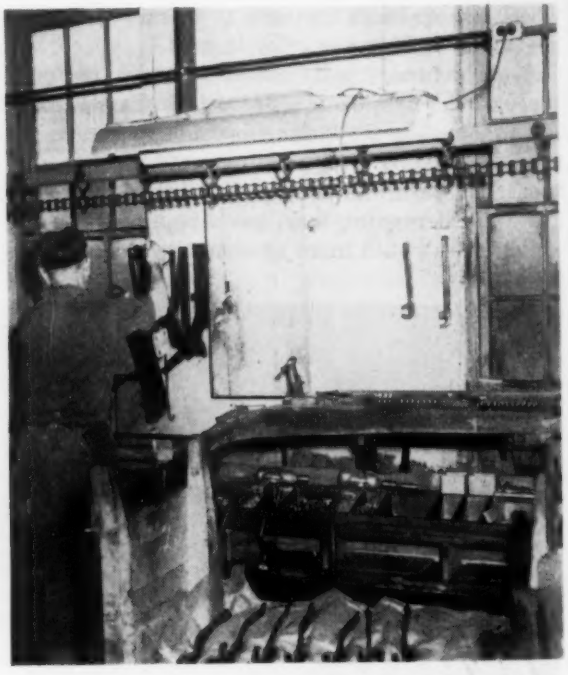


FIG. 9—Cooled parts are trucked to final assembly. Wooden fixtures, air tools are used to complete assemblies.

ing tower. The tower, Fig. 7, 2 x 5 x 8 ft at tallest end, is equipped with a fan for blowing room-temperature air down over conveyer loaded parts coming from the priming bake tunnel. Pieces are cooled appreciably, often below 100°F, before passing on to final painting, a synthetic enamel spraying.

The cooling process improves quality of the final coat of paint by preventing automatic setup of paint on a hot surface, which induces too much orange peel. Convertible linkage shown in Fig. 8 are sprayed with enamel then returned to conveyer line for a trip to final bake in a 30 ft Fostoria oven at about 250° to 260°F.

Cooled parts are trucked to final assembly, Fig. 9, where on wooden fixtures the sub-assemblies are brought together, bushed and riveted with air-powered tools. The folded convertible top set is hung on conveyer for trip to shipment—ready for installation on an automobile.

Platers Show New Products and Methods TO MINIMIZE SHORTAGES

Attendance at the 39th Annual Electroplaters Convention held in Chicago June 16 to 19 was good despite the record heat wave. About 17,000 attended the 3rd Annual Industrial Finishing Exposition held in conjunction with the American Electroplating Society meetings.

For the first time manufacturers of paints, lacquers, enamels, ovens, spray equipment and temperature controls were included in the exhibits. Over 120 new products used by metal finishers were shown at the various booths. Previously exhibits had been limited to base metals and chemicals, plating, polishing and buffing equipment and associated products.

One of the most popular exhibits was a barrel plating line which, (1) zinc coated nuts and bolts and (2) finished parts with olive-drab coat and a bleached chromate finish. This exhibit was sponsored by the Chicago Electroplaters Institute.

Another plating line that attracted wide attention was shown by Udylite Corp. which finished parts with a bright white brass coating. Throwing power of this alkali cyanide, copper zinc bath compares favorably with other types of baths. Tanks do not require special linings and white brass plating costs are less than in copper-nickel-chromium practice.

The Wyandotte Chemicals Corp. exhibit illustrated use of radioactive materials in determining the relative efficiency of metal cleaners. Stearic acid containing carbon 14 was used in these demonstrations.

The Research Institute of AES displayed a series of panels in all stages of plating from the prepared metal base to the finished product. Several base metals with a range of commercial plated coatings were shown in addition to military specification finishes.

Among the paint exhibits of high interest was the new Ransburg No. 2 method for electrostatic paint spraying and an electric spray gun which heats the paint at the gun nozzle. Substantial savings in material, elimination of orange peel and freedom from oil or water spots are claimed for the new gun which is produced by Capital Machine Co., Danbury, Conn.

White brass plating was one of the most popular subjects of the show and the technical sessions. R. B. Saltonstall, technical director, Udylite Corp., Detroit, presented a paper on white brass plating which stirred up many questions and much interest.

White brass plating was successfully done in 1939 by Du Pont using a 72 pct Zn, 28 pct Cu metallic mixture in a cyanide bath. The coating

"Changeover to white brass from bright nickel in a standard plating line is not difficult . . ."

was dull but it could be buffed and given a chromium plate which in appearance was equal to the regular bright nickel plate finish. This process found no commercial application as the white brass coating was too brittle.

White brass plating techniques and equipment have now been developed which are commercial in every respect and produce usable products. Thus many objects previously bright nickel plated are being switched over to white brass because of the nickel shortage and NPA limiting orders on nickel use.

The chromium plated white brass coatings stand up well for interior use but are not recommended for outdoor use unless protected with organic coatings. Even then the outdoor corrosion properties are not equal to bright nickel plated parts. Chief advantage of white brass coatings over bright zinc coatings is that the white brass can be chromium plated while the zinc coating can not.

The regular alkali cyanide baths produce white brass finishes at plating times up to 12 min maximum. Best bath temperature range is 60 to 85°F. A 6v dc power source is usually used. Agitation is applied either to the cathode or the solution. Usually high purity alloy anodes containing 20 pct Cu and 80 pct Zn are used although separate anodes of copper and zinc are sometimes used but the current on each anode must be carefully adjusted.

Anode efficiency is usually around 90 pct and anode current densitities for bright coatings run between 10 and 40 amp per sq ft.

Chromium plating of the white brass is done in a conventional chromic acid, sulfuric acid bath. White brass coatings can not be used for any application where the coated part would reach a temperature above 200°F. Dull and bright white brass coatings will crack if subject to 350°F temperature for 1 hr. Low ductility and internal stresses in white brass are characteristic of this type of coating.

Changeover to white brass from bright nickel in a standard plating line is not difficult. The white brass solution can be put into the bright nickel tank and the rest of the line need not be changed. The old nickel tank must be well cleaned before the white brass solution is poured in, however. Proper adjustment of current after the substitution in plating solutions is necessary for best results.

Vacuum metallizing of aluminum was presented in one of Tuesday's technical sessions by J. G. Seiter, Stokes Machine Co., Philadelphia. Metallic coating can be deposited on any material which does not give off vapors when vacuumized.

Commercial equipment consisting of a mechanical pump and a diffusion pump are available which will create a vacuum equal to 0.0005 mm column of mercury. This equipment costs about $20,000 and will Al plate 2000 to 3000 pcs for 65¢ worth of coating material. The diffusion pump has no moving parts and is easy to operate.

The aluminum is hung on tungsten wire filaments in the center of the vacuum chamber. Parts are mounted on racks inserted in the chamber where evacuation takes 15 min. The current is then turned on and aluminum vapors progress in straight lines to the periphery of the chamber. Actual deposition time is about 20 sec. Because the vapors will not plate around corners, racks holding the parts are rotated so that even coating is obtained. Film deposited is 5 millionths of an in. thick and must be protected by lacquer to preclude corrosion or oxidation.

Metallizing is a simple process but good lacquer practice is not so easy and the speaker told the group that lacquering represents 90 pct of the work in commercial vacuum metallizing practice today.

Before the parts are metallized they must be cleaned and given a lacquer coat. This may be sprayed or dipped on and in either case the lacquer produces a smooth surface which is mandatory as vapor deposits reproduce any surface irregularity on the parts. Lacquered parts are then baked 15 to 20 min to drive off solvents in the lacquer. Parts are metallized, given another

BRIGHT WHITE BRASS coating as applied on plating line set up by Udylite Corp. attracted wide attention.

WINNER of Carl E. Huessner Memorial Award was E. H. Parker of Technic, Inc., for paper "Electroplating of Gold Alloy." Award included gold medal, $50 cash. J. C. Zeder, Chrysler Corp. vice president, made presentation.

lacquer coat, then baked again. Final lacquer can be clear or colored by adding dyes.

The entire cycle takes 1 hr to completely process as many as 3000 pcs of jewelry or similar size items. Metallizing is not used to replace plating as metallized metal parts will not withstand abrasion or outdoor corrosion conditions.

Mr. Seiter showed a comparative cost of metal finishing by three methods in which regular electrolytic plating would cost $14, silver reduction methods $7, and vacuum metallizing $3 for the same number of parts.

Other technical papers included *"Some Experiences In Heavy Rhodium Plating,"* by Harold J. Wiesner, Bendix Aviation Corp., South Bend, Ind. The author discussed production problems met over a period of 1 yr. Properties of plated rhodium as a heavy surface from both phosphate and sulphate baths were reported.

Knoop hardnesses of 1050 to 1095 with a 50g load were secured on heavy deposits. This compares with Knoop hardnesses of 450 to 900 on chromium plated surfaces. Usually rhodium deposits are highly stressed, as plated, and Bendix studies show extreme care must be taken in cleaning the base metal prior to rhodium plating.

Plating results may vary between batches of solutions. Temperature and acidity of the solutions vitally affect the rate of deposition. Organic impurities in a rhodium bath are more detrimental than in other processes. So far, Bendix has not been successful in plating heavy deposits of rhodium on a rhodium base.

CARL E. HUESSNER MEMORIAL AWARD

The first Carl E. Huessner Memorial Award was presented the morning of the opening session of The American Electroplaters Society 39th Annual Convention to Edward H. Parker of Technic, Inc., Providence. J. C. Zeder, vice president, Chrysler Corp., made the awards.

For his paper, *"Electroplating of Gold Alloy"*, chosen as the best from more than 250 technical papers presented in the past year he was awarded $50 cash and a gold medal.

Second place award was presented to W. A. Wesley, D. S. Carr and E. J. Roehl of International Nickel Co. for their paper *"Nickel Plating With Insoluble Anodes."* They received $25 cash and the silver medal.

R. O. Hull and J. B. Winters of R. O. Hull and Co., Rocky River, Ohio, were presented with third place certificate of merit and $15 cash for their paper *"Operating Control With Optimum Plating Characteristics."*

At the Wednesday morning session, Myron Ceresa of Westinghouse, presented the most popular paper given at the meeting, *"A Critical Review of Substitute Finishes."* The speaker detailed development work done by the plating industry to eliminate strategic materials. A series of slides in which electrodeposited coatings used in 1949 and 1951 on appliances and automobiles were compared. Comparisons showed (1) radical changes in plating specifications are being made, (2) for interior use, nickel has temporarily disappeared, (3) use of organic finishes over chrome and Cu-Cr in white brass is increasing rapidly.

Should the material situation become increasingly critical the user will have the following plating alternates to choose from in addition to those already being tried: (1) antimony; (2) straight Cr; (3) a 90 copper 1010 alloy called Nickelex; (4) zinc combination; (5) nickel-iron-alloy; (6) composite coating of nickel plus copper plus nickel plus chromium.

While some alternates have shown promise for a limited number of applications, it was emphasized it may take up to 5 yr to thoroughly investigate new plating processes and get them into production. The industry is hopeful, he pointed out, that through improvements in plating efficiency, minor changes in specifications and a more generous allotment of critical nickel, that it will be able as far as possible to continue existing process.

Newly elected officers of the AES are: President, F. J. MacStocker; first vice president, G. P. Swift; second vice president, R. A. Schaefer; third vice president, Clyde Kelly.

"Knoop hardnesses of 1050 to 1095 with a 50g load were secured on heavy rhodium deposits . . ."

Big savings in nickel—

17 Cr stainless replaces 18-8 in many weldments

Part II

By G. E. Linnert
Research Welding Metallurgist
Armco Steel Corp.
Research Laboratories
Baltimore, Md.

Gas torch welding should not be used on types 430 or 430T grades as grain growth and/or carbon pickup may occur. Shielded welding prevents loss of titanium on 430T. Preheating when using 430 electrodes minimizes the pinhole conditions sometimes encountered. When spot welding cross wire joints a mutual indention of from 20 to 30 pct of the wire diameter is used and proper current from 1 to 10 cycles is then selected.

The oxyacetylene or gas torch welding process is not recommended for joining either type 430 or 430 Ti. The process normally involves much heating of the base metal adjacent to the weld and therefore both grades will undergo considerable grain growth in this zone. The type 430 material also forms martensite as shown in Figure 3. Although annealing can be depended upon to remove the hard martensite, the coarse grains cannot be refined. The data in Table IV* shows little improvement in the properties of an oxyacetylene welded joint after annealing.

Because the oxyacetylene welding flame is normally adjusted to have a small excess acetylene feather, the danger of carbon pickup by the molten weld pool is always present. If the weld metal is type 430 composition the pickup may be especially detrimental to the as-welded properties. An austenitic Cr-Ni weld filler rod would avoid the brittleness associated with carbon pickup, but here a type 347 rod (containing columbium) would be necessary to avoid corrosion difficulties in the weld metal.

The oxyacetylene process does not provide sufficient protection from oxidation to permit the making of a type 430 Ti weld deposit. The loss of titanium from the melted base metal and/or filler rod would be virtually complete, thus leaving a weld of essentially 430 composition.

Atomic-hydrogen arc-welding can be applied very successfully to the 17 Cr steels. The neat input may be somewhat higher than the metal-arc or tungsten-arc processes, but is not nearly as high as the oxyacetylene process. The shield of hydrogen gas permits welding without a flux. However, the effeciveness of this gaseous shield in preventing loss of titanium from the molten weld pool or filler rod has not been established. The process is particularly suited for making corner joints and edge welds in thin sheet.

Metal-arc welding is the process most widely used on the 17 Cr steels. The amount of heating at the joint is usually substantially less than

Tables III and IV reference in this article will be found in Part I of this series, published in The Iron Age last week.

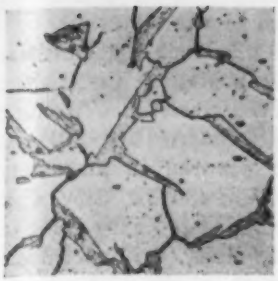


FIG. 3—Microstructure of type 430 stainless in heat affected zone of oxy-acetylene welded joint showing coarse ferrite grains and martensite, 250X.

with the oxyacetylene or atomic-hydrogen processes.

Type 430 covered electrodes are supplied by most manufacturers to the requirements of ASTM-AWS Series E-430. This specification indicates that welding with this grade electrode usually requires preheating and post-annealing. Mechanical properties expected of weld metal after the letter treatment are 70,000 psi min tensile strength and 20 pct elongation in 2 in. The data presented earlier in Table III shows the unpromising tensile properties of as-deposited weld metal. Because of the limited use of 430 electrodes in the past, this grade may not be as readily available in the many sizes and types of coverings as normally found in the Cr-Ni electrodes.

A difficulty sometimes encountered with 430 electrodes is the tendency for the weld deposit to contain gas pockets or pinholes. The cause of this defect is sometimes attributed to the poor flowing characteristics of 17 Cr weld metal. Preheating is reported to minimize the pinhole condition, and even heating the electrodes just before deposition is claimed to help. Cold cracking in the weld metal may also occur, but no more than should be expected of a low ductility weld deposit.

Austenitic Cr-Ni electrodes have a definite place in the metal-arc welding of 17 Cr steels, and fortunately their purchase is still permitted for use on plain-chromium stainless steels. For weldment which are not post-annealed, the Cr-Ni weld deposit provides a more ductile weld joint. Data for metal-arc welded 430 steel in Table IV show a bend angle of only 15° when a 430 electrode was used as compared with 85° when a 308 electrode was applied.

The improvement in ductility obtained through use of 430 Ti steel is brought out by the 180° bend test value reported in Table IV. These specimens were joined with a 308 electrode. The use of 430 weld metal undoubtedly would cause failure at a low angle of bend.

The submerged-arc process is usually employed on fairly heavy base material using a minimum number of weld passes. Because these conditions involve high heat imput and a large volume of molten weld metal, 17 Cr steel obviously must be carefully handled to guard against cracking. An austenitic Cr-Ni weld deposit is often used and it is imperative that the dilution with the base metal be taken into account. The dilution of the filler rod composition by base metal can range from about 10 to 70 pct depending upon welding conditions in this process. An electrode wire grade must be selected that will tolerate the anticipated dilution and yet produce the required austenitic weld structure.

Argon or helium shielded tungsten-arc welding is customarily confined to sheet or very light plate because of the disadvantages associated with the addition of a separate filler rod to heavier joints. The process is well suited for types 430 and 430 Ti since high rates of travel speed can be attained and the amount of fused metal held to a minimum. The low heat imput along the joint minimizes the structural change in the adjacent base metal. The bend test data in Table IV for inert-arc welded 430 steel show an improvement in ductility over that for metal-arc welded joints regardless of the type of weld metal used.

The data reported for 430 Ti steel in Table IV cover inert-arc joints made without filler rod. Since the process offers excellent protection for the titanium during fusion, the weld metal in these specimens also represents a 430 Ti composition and the weld structure is wholly ferritic. The bend angle of 180° is considered very encouraging.

The familiar tables of recommended practices prepared by the AWS Resistance Welding Committee and published by both the AWS and the RWMA cover the austenitic Cr-Ni grades only. Because of the need for information concerning the strength of spot welded joints in the 17 Cr steels has already arisen in the field, a series of single-spot tension-shear and U-tension tests were conducted to determine in a preliminary way the optimum welding conditions and the strength of spot welds in 430 and 430 Ti sheet. Similar tests were also conducted on 304 sheet to obtain data for comparison.

TABLE V

RESISTANCE SPOT WELDED JOINTS

Material	Condition Prior to Testing	Thickness, Inches	U-Tension Strength, Lbs.	Tension/Shear Strength, Lbs.	Tension/Shear Str. Ratio
Minimum Values Expected of Austenitic Cr-Ni Steels-AWS	As-Welded	0.019	....	335	....
		0.024	....	470	....
		0.032	....	720	....
Type 304 (18-8)	As-Welded	0.018	587	617	0.95
		0.025	970	930	1.04
		0.031	1160	1266	0.92
Type 430 (17 Cr)	As-Welded	0.019	628	810	0.77
		0.024	918	1023	0.89
		0.032	1113	1837	0.61
	Welded and Annealed	0.019	817	787	1.04
		0.024	990	985	1.00
		0.032	1492	1795	0.83
Type 430 Ti (17 Cr + Titanium)	As-Welded	0.031	646	1553	0.41

"Manufacturers planning to use 430 wire . . . should study the spot welding characteristics . . ."

Several gages of sheet were selected for testing to note any trends brought about by material thickness and to permit interpolation of strength values for intermediate gages. Specimens in triplicate were tested in the as-welded condition or welded and post-annealed at 1450°F. Spot welds were made in each gage of sheet with machne settings of 1, 10, 20 and 30 cycles of (60 cycle) current to determine the effect of welding time.

The spot welding schedules were established for each weld time in accordance with customary practice. The electrode tips were domed (2.5 in. radius) and the force held as high as possible without excessive indentation. All gages invariably produced the strongest welds with 10 cycles of welding current. Presumably the weld time controlled the extent of penetration and the optimum range of penetration has been fairly well established as approximately 30 to 60 pct of the thickness of the outer members. Therefore, the data from the joints made with a current of 10 cycle duration were used to compare the strength of the materials.

Table V contains the minimum tension-shear values for spot-welds in austenitic Cr-Ni sheet as set forth by the AWS Resistance Welding Committee. These requirements are followed by the average values secured in laboratory tests on types 304, 430, and 430 Ti. Since spot welds are generally intended to carry loads in shear, the designer may gain confidence from the greater shear strength of the 17 Cr steels as compared with the 18-8 steel. However, consideration must be given to the ductility of the joint, and this is a property which is extremely difficult to evaluate. The ratio of the tensile strength to the tension-shear strength of a spot weld is believed to be indicative of the ductility and here lies the purpose of the U-tension tests.

The extreme right-hand column of data in Table V contains the U-tension strength to tension-shear strength ratios. This ratio for spot-welded joints in 18-8 sheet is close to 1.00 even in the as-welded condition. Joints in 430 sheet display ratios ranging from 0.61 to 0.80 in the as-welded condition, and must be annealed to obtain a ratio in the vicinity of 1.00. Spot-welded joints in the one gage of 430 Ti sheet tested produced a low ratio of 0.41, which suggests strong notch sensitivity.

How to fabricate stainless wire products—

Manufacturers planning to use 430 wire as an alternate for 18-8 wire, or possibly in place of plain-carbon steel wire which has been copper-nickel-chromium plated, also would do well to study the spot-welding characteristics of the 17 Cr steel. Mass production wire products such as dishwasher baskets, grocery market carts, textile mill bobbin boards, refrigerator shelves, and so forth contain various forms of lap welds, tee-joints and cross-wire welds, which must withstand stress and strain.

Strength was determined by gripping cross-wire specimens in a special fixture and loading the joint in pure tension. Joints in 430 wire were found to reach only 70 to 75 pct of the tensile strength of joints in 302 wire, but were still about 25 pct higher than joints in mild steel wire. Sample "peel" tests, wherein the joint is broken by rolling back one of the wire members will show joints in 302 wire to be substantially more ductile than those in 430 wire. However, in a properly designed wire article, there should be little reason for concern about joint ductility.

More care is required in planning a welding schedule for 430 wire than for 302 wire. Although the same general welding technique is used, the permissible limits for the welding conditions are more critical. The necessity for short welding time becomes more important as the wire diameter decreases because the resistance heating must be localized at the contracting wire surfaces to avoid crushing the smaller sections. Best results are obtained with a welding machine equipped with full electronic controls and a synchronous current application device.

The usual procedure in adjusting a spot-welding machine to produce good cross-wire joints in 430 wire is first to make note of the mutual indentation required. This generally ranges from 20 to 30 pct of the wire diameters. The number of cycles of current is then selected. The weld time may range from one to possibly 10 cycles duration depending upon the wire size and type of machine. Next, the tip pressure is adjusted to a moderate level commensurate with the wire size. The welding current (amperage) is then progressively increased until a joint with the required percentage of mutual indentation is secured.

The corrosion resistance of 430 spot-welded wire joints also deserves special attention. Experience has shown that the crevices and folds in the weld flash around a joint in wire afford a location for "crevice corrosion" to take place when the article is exposed in mildly corrosive media under some conditions. This localized resting of weld joints is often referred to as "bleeding." The presence of weld scale

in the joint crevices will accelerate crevice corrosion, particularly in the 430 material. For this reason, articles of welded 430 wire should be thoroughly cleaned by pickling or electropolishing whenever the possibility of bleeding exists.

This problem has been encountered in articles like refrigerator shelves where bleeding of the weld joints results in unsightly appearance. In addition to a thorough electropolishing treatment to minimize the chances of bleeding, wire articles are sometimes dipped in a clear lacquer (after treating the surface with a phosphate solution) to form a protective coating around the weld joints and seal the crevices.

Butt-joints in wire can be made by two different electrical resistance processes; (1) flash-butt welding, and (2) upset-butt welding. The flash-butt process is better suited for 430 material because the heat-affected zones adjacent to the weld are smaller. Although butt-weld joints in 430 wire should never be expected to equal the ducility of joints in 302 wire, 430 joints should be satisfactory for most applications with proper welding technique.

The first rule in making either flash-butt or upset-butt joints in wire is the use of the shortest welding time and the lowest current requisite for a completely fused section. The next rule is a minimum amount of heat flowing into the wire on each side of the joint. The current-carrying jaws should be as small as possible and still permit adequate flashing or upsetting to hold to a minimum the length of wire which reaches a temperature sufficiently high for grain growth to occur. The upset in either process should be generous to insure a clean, sound weld.

Annealing improves butt joint ductility

To improve the ductility of butt-joints in 430 wire, such joints can be annealed conveniently in the butt-welding machine. The as-welded joint is unclamped and removed from the contact jaws to permit the jaws to open to their normal position. The weld flash should then be removed. The welded section is then held in contact with jaws while current is again passed across this portion to heat the material to a dull cherry red (about 1450°F), but not higher! The heating rate and ultimate temperature of the wire is best controlled by tripping the contactor repeatedly to interrupt the passage of current. After reaching the annealing temperature, the wire is permitted to air cool. When the butt-joint is expected to withstand a winding or a forming operation, heating the weld area to approximately 350°F may be helpful in avoiding breakage since 430 material possesses greater toughness at temperatures above 200°F.

Where circumstances will permit a dissimilar metal joint, a butt weld between 302 wire and 430 wire can be expected to display better ductility in the as-welded condition. Joints of this kind can be arranged for many operations using a continuous length of wire (wire drawing, weaving screens, etc.) by simply inserting a short length of the 302 material.

When a welded article of 430 is to be annealed to improve the mechanical properties of the weld joints, the operation is usually carried out at temperatures below 1550°F. If exposed to temperatures above approximately 1650°F for any prolonged period of time, the article would develop a coarser grain size and possiblly some hard martensite throughout the entire structure. The customary annealing temperature is 1450°F. The time at temperature is dependent upon the mass involved and may vary from only a few minutes for very light gage sheet to several hours for heavy plate. It is important to remember that the high temperature strength of 430 is not as high as that of 18-8 and hence more care must be taken to support light structures or broad sections to avoid excessive sagging.

Avoid slow cool thru 1050° to 750°F range

Cooling the 430 material from the annealing temperature can be done in air or by water quenching. Often the parts are allowed to furnace cool to about 1100°F so that the parts can better withstand handling. However, slow cooling through the temperature range of 1050° down to 750°F must be avoided since it induces brittleness. Heavy sections usually require at least a spray quench to bring them safely through this range of embrittlement.

The use of austenitic Cr-Ni weld metal in weldments of 430 which are to be post-annealed is liable to introduce several problems. The annealing temperature normally used for 430 falls within the sensitizing temperature range (where carbide precipitation occurs) for austenitic stainless steel and unless the Cr-Ni weld metal is stabilized with columbium or titanium, or has an extra-low-carbon content, the corrosion resistance of the weld metal will be seriously endangered.

The best insurance against corrosion arising unexpectedly from some external condition on a welded seam is to grind or machine the surface of the joint until it is smooth, clean and free of any discontinuity. Crevices are objectionable in welded structures of 17 Cr steels because of the greater incidence of crevice corrosion. A crevice may be innate to the joint itself, such as found in edge-joints, unfused roots or abutting faces, and lap joints. In some

"The best insurance against corrosion is machine the surface of the joint smooth . . ."

"17 Cr steels are not subject to intergranular carbide precipitation . . ."

cases it may occur accidentally, as in undercutting along a fusion weld. The likelihood of crevice corrosion taking place is difficult to predict, and this is further good reason why the design engineer should plan joints without unfused notches or other discontinuities if possible.

Particles of slag or fused flux which cling to the surface can breed corrosion. While most of the fused flux from stainless steel welding electrodes is more or less inert, the particles hamper the surface passivating tendency of the steel, and yet are sufficiently porous to retain corrosive liquids. Chipping or hammering does not always completely remove the slag or flux deposits and an operation like sandblasting, grinding, or pickling may be required to remove the final small particles.

The weld scale or temper coloration along the joint can easily cause superficial rusting in welded 17 Cr steels. The brown to blue-black heat tint or oxide on the surface promotes rusting through electrochemical action even in a mildly corrosive solution. Types 430 and 430 Ti display a far greater susceptibility to rusting from this cause than 18-8 material, and it is important that welded 17 Cr be cleaned of weld scale. This may be done by sandblasting, grinding, pickling, electropolishing, and etc.

Welded ferritic stainless steels like the 17 Cr steels are not subject to the intergranular carbide precipitation which causes corrosion in austenitic Cr-Ni steels. The structural changes in the base metal heat-affected zones of welded 430 are an annoyance because of their detrimental effect upon ductility, but that they do not detract from the corrosion resistance of the joint. However, a peculiar form of corrosive attack associated with welded joints in 430 material was found by these laboratories a number of years ago. Metallographic examination of the welded joints in a 430 metal-arc welded vessel disclosed complete penetration of the wall by corrosive attack which progressed intergranularly through the heat-affected base metal zones as illustrated in Fig. 4. The attack apparently was associated with the martensitic structure in the heat-affected zone.

TABLE VI

INTERGRANULAR CORROSION
Tests on Fusion Welded Specimens

Base Metal Type	Thickness	Welding Process	Filler Metal Type	Condition Before Testing	Extent of Attack by Acidified Copper-Sulfate Solution Determined Metallographically	
					Heat-Affected Base Metal	Weld Metal Deposit
430	0.083 in.	Oxy-Acetylene	430	AW	Heavy	Heavy
				ANN	None	None
		Metal-Arc	E430	AW	Heavy	Heavy
				ANN	None	None
			308	AW	Heavy	None
		Inert-Arc	430	AW	Heavy	Heavy
				ANN	None	None
			308	AW	Heavy	None
430 Ti	0.069 in.	Metal-Arc	E308	AW	None	None
		Inert-Arc	None	AW	None	None

Specimens exposed to copper sulfate-sulfuric acid solution as specified in ASTM A 240-49 for 72 hour period.

In laboratory tests, welded specimens were prepared using various combinations of base materials, weld metals and processes to study the peculiar attack on the base metal heat-affected zones. Sections from these specimens were then exposed to the ASTM test for intergranular corrosion which employs the copper sulfate-sulfuric acid solution and is normally applied to austenitic Cr-Ni steels. The test results given in Table VI show regular 430 material in the as-welded condition to be susceptible to the intergranular attack in both the base metal heat-affected zones and the 430 weld metal. By annealing the welded 430 material, the susceptibility to attack was eliminated. Type 430 Ti material in the as-welded condition was not susceptible to intergranular attack in as-welded 430 appeared to be promoted by martensite in the structure. The area of greatest susceptibility was the outer portion of the heat-affected zone in which the first signs of martensite would be expected to appear in the grain boundaries. The absence of corrosion in the post-annealed 430 and the as-welded 430 Ti appeared attributable to the removal of martensite. Work is continuing to determine the possibility of encountering this form of corrosion in service.

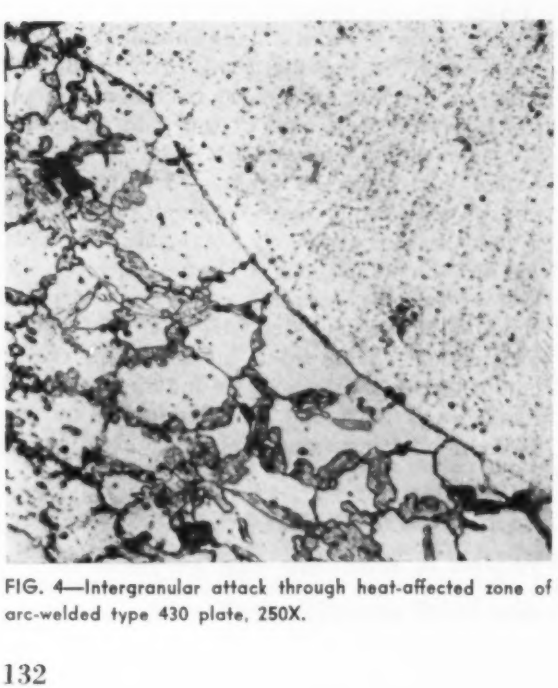


FIG. 4—Intergranular attack through heat-affected zone of arc-welded type 430 plate, 250X.

Mechanized foundries

A lavishly illustrated foundry bulletin has been put out by Bartlett-Snow, engineering specialists in the mechanization of production, jobbing, ferrous and nonferrous foundries. The new booklet shows countless applications of the company's extensive line of mechanized foundry units for different phases of foundry operation. *C. O. Bartlett & Snow Co.*

For free copy circle No. 13 on postcard, p. 137.

Humidity control

Humidity engineered to order is provided by Kathbar humidity conditioning equipment covered in a new mailing piece. Designed to humidity condition air used in processes involving moisture-sensitive materials or just to make plant life more bearable, the units can control air temperatures and dew points in a range of plus or minus 100°F. *Surface Combustion Corp.*

For free copy circle No. 14 on postcard, p. 137.

Ratio totalizer

A new brochure is available describing the Hagan Ratio Totalizer, a pneumatically operated control mechanism. The ratio totalizer is applicable for accurately combining input control pressures and spring forces, and producing an output control pressure based on addition, subtraction, multiplication, division or more complicated functions of the input control signals. The output signal represents any desired combination of the input signals. A maximum of three input signal pressures plus three spring pressures can be accommodated in a single unit. *Hagan Corp.*

For free copy circle No. 15 on postcard, p. 137.

Dust collector

Dust, chips and shavings are a common nuisance in many industries. The Dustbuster, a low-cost, high-suction dust collector, described in a new booklet, has been designed to eliminate this problem. The self-contained unit was especially adapted for large volume dusts that are not highly inflammable. *Aget-Detroit Co.*

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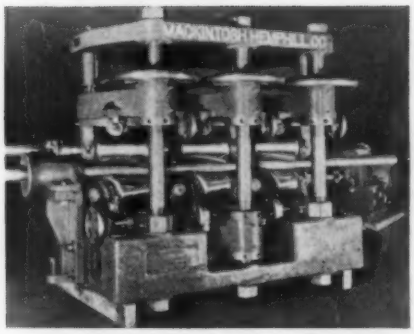
NEW equipment

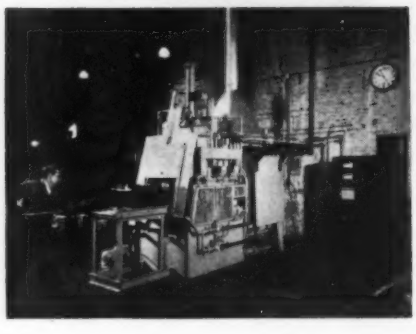
New and improved production ideas, equipment, services and methods described here offer production economies . . . fill in and mail postcard on page 137 or 138.



Rotary straightener for production line work

Guideless rotary straighteners will straighten steel tubing in commercial pipe sizes from ½ to 1¾ in. OD; brass, copper, aluminum and other nonferrous metal thin wall tubing in sizes to 3 in. OD. Two highspeed, silent chain type drives, actuated by two 10-hp dc motors, drive all six forged and hardened alloy steel rolls. These are equipped with anti-friction bearings. Production speeds from 40 to 400 ft or more of tubing per min are obtainable. Closed offset center pas principle is used, and the Model AN is guideless, which the manufacturer states assures high surface quality of tubing. *Mackintosh-Hemphill Co.*

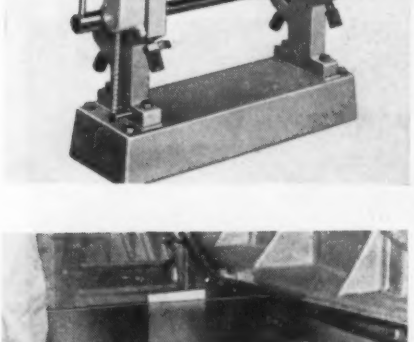
For more data circle No. 17 on postcard, p. 137.



Radiant tube furnace hardens 250 lb work per hour

A new gas fired vertical radiant tube carbonitriding furnace is a completely packaged unit with built-in quench system and automatic cycle control. It is rated 250 net lb per hr for hardening or flash case, dry cyaniding. Lightweight vertical radiant tubes can be removed and replaced in a matter of minutes, eliminating costly production downtime. The Hyen endothermic atmosphere generator is adjustable to produce different atmospheres not only for carbonitriding, but for carburizing annealing and bright hardening. *Lindberg Engineering Co.*

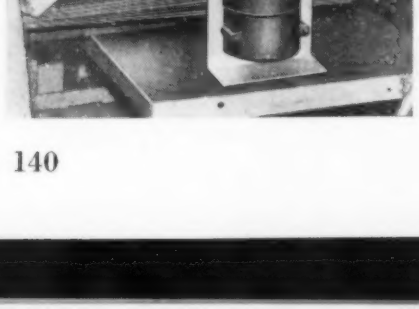
For more data circle No. 18 on postcard, p. 137.



Roller saves time, offers bending versatility

With a new hand-operated slip roll, complete circles in 16 gage steel can be formed in one-third less time than it ordinarily takes. The machine will also form bends at any point in a sheet of material. Because of its cam actuated idler roll, complete circles of 1 in. diam or larger can be formed in two passes through the rolls. Parts can be duplicated with great accuracy and at high rate of production. Round, flat and square stock and other ductile materials can be formed with the machine. Di-Acro rollers in two sizes form material to 6 and 12 in. wide. Sample with specifications may be sent for test forming. *O'Neil-Irwin Mfg. Co.*

For more data circle No. 19 on postcard, p. 137.



Separator removes top sheet of steel from stack

The Caufield sheet steel separator permits automatic separation of stacked steel sheets. With it production has increased 100 pct in some applications. When the separator is used, the top sheet is always raised about 2 in. above the balance of the stack. As each steel sheet is removed, the next one is raised and separated ready for immediate transfer to a press or machine. Separators are used singly or in pairs. Four sizes available are 6½, 9, 10 and 15 in. *Clark Hopkins Equipment Co.*

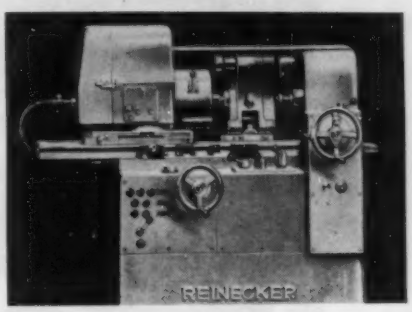
For more data circle No. 20 on postcard, p. 137.

Four machines can drill 600 holes at one time

Zagar has standardized four sizes —16, 24, 32 and 40 in.—of heavy duty drilling machines to drill as many as 600 holes at one time. Machines have Zagar drill heads which are interchangeable and changing from one job to another can be accomplished in a few hours. Drill heads are driven directly by electric motors ranging from 5 to 30 hp. A hydraulic ram in the base of the machine feeds the work into drills and automatically lowers to original position after drilling is completed. Cycling, completely automatic or semi-automatic, is controlled hydraulically with electrical controls. Oil and coolant reservoirs, pumps, hydraulic controls and electric motors are located in a steel base. Any size work from typewriter frames to turbojet frames can be handled. *Zagar Tool, Inc.*

For more data circle No. 21 on postcard, p. 137.

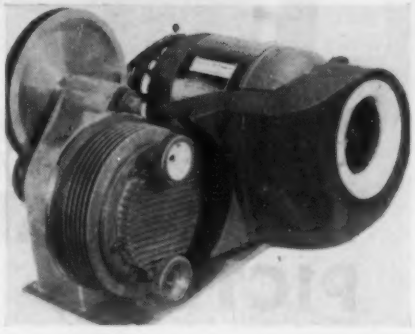
Internal and face grinding possible in one setup



In the Reinecker Model JSOP machine, internal and face grinding operations are performed in a single setting of the workpiece. Combining both operations in one setup reduces rechucking and centering time, assures a ground face which is true to the bore, and increases output. Operation is by single lever control for rapid travel, grinding movement, work spindle rotation and coolant flow. Grinder provides hydraulic, infinitely variable table movement, grinding wheel infeed and hydraulic movement of the face grinding bracket, adaptable for cup and face wheels. *Kurt Orban Co.*

For more data circle No. 22 on postcard, p. 137.

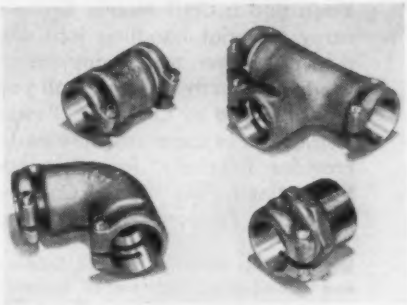
Abrasive shot and grit tested in one minute



An abrasive shot and grit testing unit called the Mattson-Cargill Shot Breakdown Tester, subjects shot or grit particles to repeated impact in a manner similar to that in production shot blasting machines. Useful life of the shot samples is indicated by screening the samples through standard sieves after a standard length of time in the machine. Machine weighs 195 lb, operates automatically, uses a 50 gram shot or grit sample. It is recommended for acceptance testing of shot shipments and for laboratory testing. Weighing, loading, unloading and screening requires approximately 5 min. *Precision Shot Co.*

For more data circle No. 23 on postcard, p. 137.

Coupling can be joined without threading



Quikupl stainless steel fitting is designed to reduce assembly costs and to permit use of less expensive, lighter-wall stainless steel tubing. The coupling can be joined to tube or pipe without threading, flaring, sweat-soldering, brazing or welding. Pipe or tube is simply cut to length, deburred and inserted in the fitting. Coupling is completed by tightening a small screw. Inside the fitting a synthetic sealing ring is contained in a groove machined into the bore of the Quikupl. This resilient seal provides and maintains a squeeze fit regardless of commercial tube and pipe tolerances. *Cooper Alloy Foundry Co.*

For more data circle No. 24 on postcard, p. 137.

Two-way gage speeds inspection of bands

To facilitate inspection of copper rotating bands, used on artillery projectiles, for both wall thickness and depth, quality control engineers at Chase Brass & Copper designed a special two-way gage. As the rotating band is turned, the dials indicate wall-thickness and depth continuously so that any deviation from specifications in any part of the band may be detected quickly. Use of the gage makes inspection more complete and reduces time formerly required when conventional micrometers were used. *Chase Brass & Copper Co.*

For more data circle No. 25 on postcard, p. 137.

Turn Page

—New Equipment—

Continued

Aluminum boxes

One hundred fifty standard sizes of seamless, deep drawn aluminum boxes serve a wide variety of requirements of the electronic and aircraft industries. Boxes can be fabricated to specific requirements and furnished complete with fasteners installed, holes punched, and brackets mounted as required. *Zero Mfg. Co.*

For more data circle No. 26 on postcard, p. 137.

Oil-tight pushbuttons

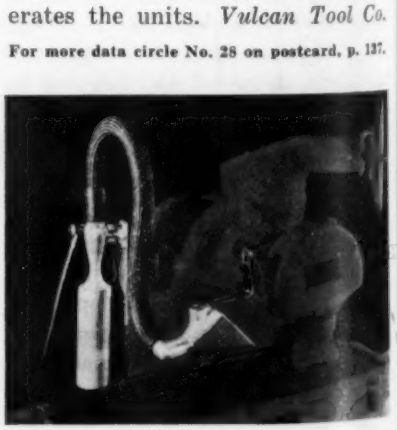
New oil-tight pushbutton units for machine tool applications are designed on the building block principle, feature self-a-line contacts and removable color rings for pushbutton identification. Building block construction provides increased flexibility of application because basic units can be arranged in various combinations to meet special or standard requirements. *General Electric Co.*

For more data circle No. 27 on postcard, p. 137.

Individual dust units

Inexpensive, compact units, with no moving parts, for use on surface grinders and other grinding machines where grinding dust must be removed operate from shop air supply. Units are easily installed in a few minutes. Two sizes are available: 24 cu in. capacity for grinding wheels of 2 in. diam and under; 56 cu in. for up to 7-in. diam wheels. Vulcanaire dust collecting units are quickly cleaned, require no refills. Dust cup is mounted on grinding wheel guard or close to grinding wheel. A simple needle valve operates the units. *Vulcan Tool Co.*

For more data circle No. 28 on postcard, p. 137.



Drum handler

Different size drums can be carried two-at-a-time with a new attachment that clamps on forks of trucks. It is a horizontal handler, mechanically operated; requires no special hydraulic system components. Installation or removal requires minimum of time. *Yale & Towne Mfg. Co.*

For more data circle No. 29 on postcard, p. 137.

Motor starter

A combination across-the-line motor starter with circuit breaker, in which the components are mounted side-by-side has been developed for use where such a mounting is desired for reasons of space and arrangement. The starter has self-indicating slamproof handle with vertical mounting, and separate positions for on, tripped, off, reset and open cover. Sizes 0, 1 and 2 in sheet-steel enclosures for NEMA types I, IA, and V are available. *Westinghouse Electric Corp.*

For more data circle No. 30 on postcard, p. 137.

Filtration unit

Two-stage portable transfer unit for cleaning hydraulic oils in machine tools consists of a Yale & Towne pump and a Cuno Auto-Klean metal-edge filter in the first stage. Second stage filter is a Cuno Micro-Klean filter which filters out everything to 25 microns in size. All tubing and Parker fittings are to JIC standards and 1½-in. hose assemblies provide quick assembly to the tanks. Circulation rate is 10 gpm. *J. N. Fauver Co., Inc.*

For more data circle No. 31 on postcard, p. 137.

Turn Page

—New Equipment—

Continued

Lead-bearing steels

Super La-Led is a free-machining, open-hearth steel containing about ¼ pct lead and nearly ½ pct sulfur. Production tests have shown 80 pct faster machinability than B1113. Leaded TS 4140 Modified is a lead-bearing alloy with improved machinability made possible by lead addition; said to machine one-third faster than the comparable non-leaded grade. Both steels are available cold drawn in various size ranges in rounds and hexagons. *La Salle Steel Co.*

For more data circle No. 32 on postcard, p. 137.

Truck fork extensions

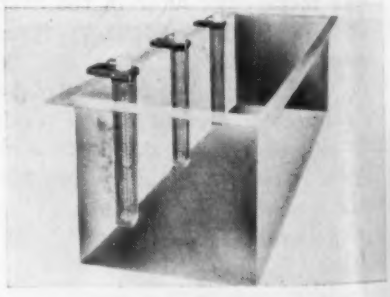
Unusually long loads can be handled easily and safely when Towmotor is equipped with sturdy fork extensions. They are designed for safe handling of such loads as steel sheets, skids and boxes of unusual length; are easily removed. Locking feature prevents movement forward or backward over regular forks. *Towmotor Corp.*

For more data circle No. 33 on postcard, p. 137.

Immersion heater

Glorod electric immersion heater made of fused quartz is totally inert to acids and requires no cleaning or maintenance. As one of the best electrical insulating materials known, fused quartz also eliminates stray currents in electroplating work. Glorod is used for heating electropolishing and electroplating baths as well as phosphatizing solutions. Its functional design, versatility and light weight for easy handling are advantages for metal finishing work. *Cleveland Process Co.*

For more data circle No. 34 on postcard, p. 137.

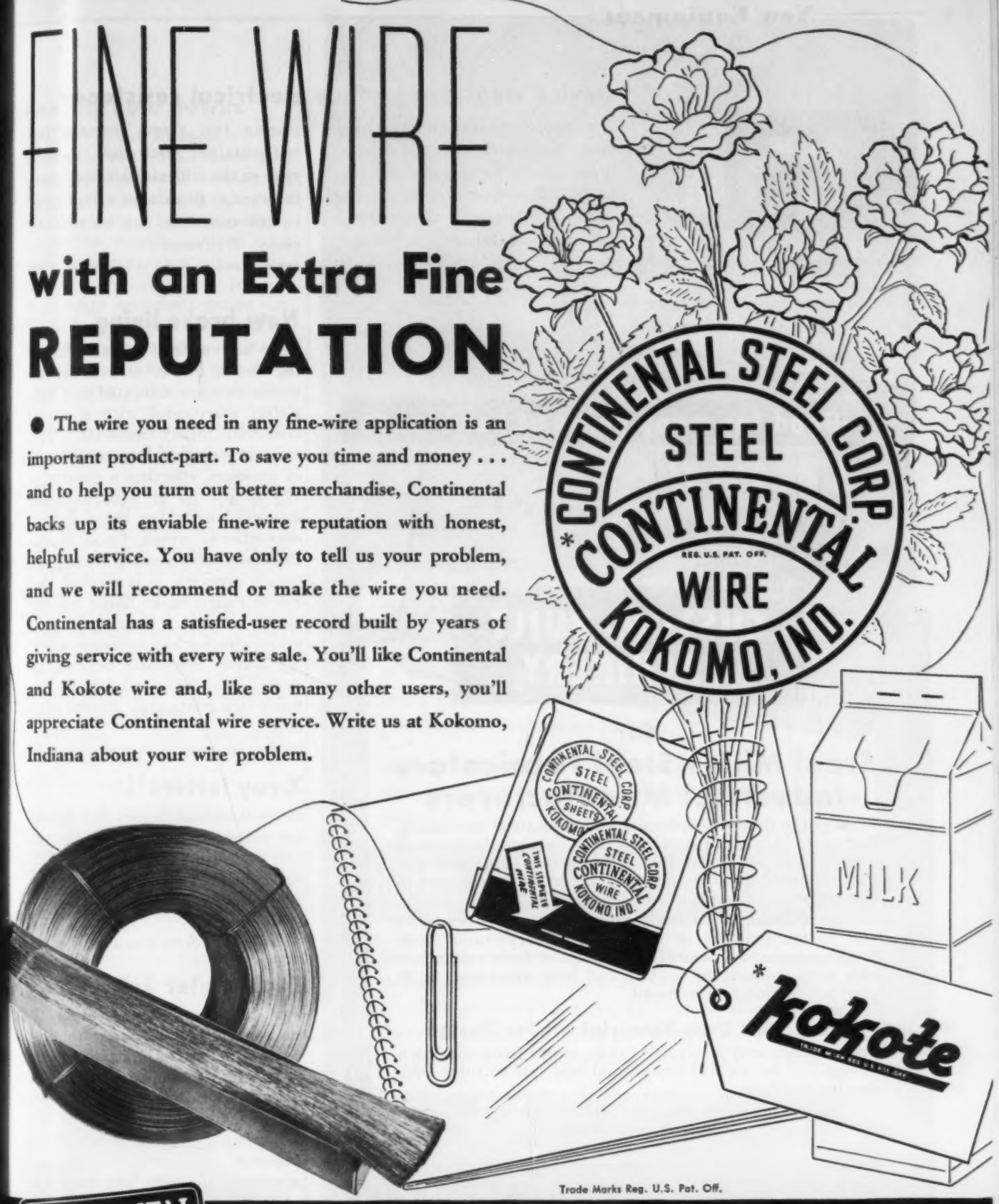


Turn Page

FINE WIRE

with an Extra Fine REPUTATION

● The wire you need in any fine-wire application is an important product-part. To save you time and money . . . and to help you turn out better merchandise, Continental backs up its enviable fine-wire reputation with honest, helpful service. You have only to tell us your problem, and we will recommend or make the wire you need. Continental has a satisfied-user record built by years of giving service with every wire sale. You'll like Continental and Kokote wire and, like so many other users, you'll appreciate Continental wire service. Write us at Kokomo, Indiana about your wire problem.



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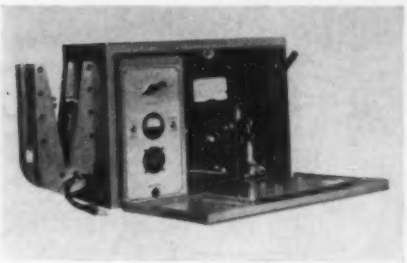
CONTINENTAL STEEL

CONTINENTAL STEEL CORPORATION

GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF *Manufacturer's Wire* in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.



Device measures surface electrical resistance

A surface resistance indicator measures surface electrical resistance, directly in microhms, as a criterion of the effectiveness of a cleaning process. Resistance of aluminum and other materials with low surface resistance are measured by placing two sheets between two self-contained electrodes. V or C yoke on the indicator accommodates the sheets. Resistance values of 10 to 100 microhms can be read directly. *Weltronic Co.*

For more data circle No. 35 on postcard, p. 137.

New brake lining

In a new method of manufacturing brake lining, strands of asbestos web are saturated and completely surrounded with a special frictional binder material. This mass is compressed under 300 tons of pressure, effecting a density of 120 lb per cu ft with a tensile strength nearly ten times that of conventional woven brake lining. Because of this greater density and tensile strength, it is claimed that Fused Fabric brake lining will not absorb water. Frictional heat evaporates surface moisture, allowing almost immediate braking recovery. Grabbing and fade are reduced to a minimum. *Russell Mfg. Co.*

For more data circle No. 36 on postcard, p. 137.

X-ray letters

Extra-thick lead letters and figures for industrial X-ray use withstand long exposure and heavy rays without fading. They are ¼ in. thick, ½, ¾ and 1 in. high. *H. W. Knight & Son, Inc.*

For more data circle No. 37 on postcard, p. 137.

Tachometer kits

New tachometer kits contain all the components necessary to provide instantaneous and permanent records of machine performance at a central location. A typical installation would include a dc tachometer generator, a tachometer indicator, a switchboard-type tachometer recorder, and (where a continuous web of material is produced) a web-break detector. Audible or visual alarm systems are optional accessories. Four kits are available in the new line. *General Electric Co.*

For more data circle No. 38 on postcard, p. 137.

Non-slip hold downs

The jaw recess surfaces of new hold-downs are so designed that when vise pressure is exerted the jaws are forced down, gripping the work securely. Positive seating against the bottom and the back recess surfaces takes place automatically, preventing any forward or sideways movement under cutting tool pressures. Automatic locking action is governed by movement of the jaws up and down under spring control. *Ready Tool Co.*

For more data circle No. 39 on postcard, p. 137.

Floor resurfacing

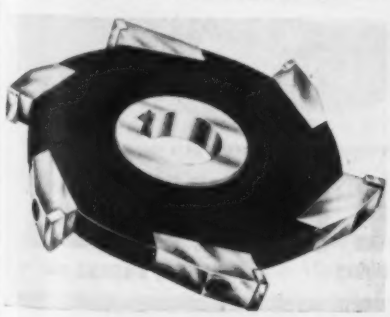
A new material for resurfacing and patching concrete floors indoors or out provides an extra hard surface to facilitate hand trucking. Named Steelhard, the compound is made of extra tough resins and non-stone aggregates. It comes ready to use; is easily applied by priming the old flooring surface, spreading a thin layer and rolling to a smooth surface. Steelhard will withstand heavy traffic 4 to 6 hr after application. Color is gray. *Monroe Co.*

For more data circle No. 40 on postcard, p. 137.

Milling cutters

New carbide tipped milling cutter has interchangeable blades seated on periphery of cutter body with tail end seated against an abutment in the body. Cutting forces are transmitted to the body through this abutment. Heat treated body bound screws locate blades against body abutment through a conical seat. Bodies can be bladed for straight slotting, alternate blade slotting or half side milling. *Kraus Design, Inc.*

For more data circle No. 41 on postcard, p. 137.



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Metal shearing tool

Fourteen gage stainless steel and mild steel up to ⅛ in. thick can be cut with a new metal shearing tool illustrated. It operates on a simple leverage principle, is portable, weighs 9 lb. It can be used in almost any bench vise. Mounted on a tripod it becomes a stationary piece of equipment. Cutting with the tool reduces curling to a minimum and burring is practically eliminated. Tool cuts straight lines, curves, right angles. *McCoy Products Co.*

For more data circle No. 42 on postcard, p. 137.

Shipping damage

By using a three-way impact recorder, shippers can trace down the cause of shipping damage both by the time element (it records the time of shock) and the direction and severity of jolts which the package receives. This eliminates guesswork as to who was responsible for damage. Three individually operating scribe arms record impacts from all directions and an electrically operated motor makes it possible for the Impact-O-Graph to operate continuously a minimum of 28 days. *Impact-O-Graph Corp.*

For more data circle No. 43 on postcard, p. 137.

Aluminum paint

New aluminum anti-rust paint can be applied right over rust without wire brushing or scraping. It can be used outdoors or indoors on any kind of metal. On clean metal it protects and preserves against future rust attacks. Over rusted surfaces it is reputed to penetrate and seal the surface and stop further rust action. *Paramount Industrial Products Co.*

For more data circle No. 44 on postcard, p. 137.

Ghost Plants and Mass Unemployment Mark Strike

Fifth week of strike rapidly paralyzing economy . . . Idle men worse than idle machines . . . Union pierces outer perimeter of union shop resistance . . . Scrap market loses a little.

In its fifth week the steel strike is rapidly paralyzing the economy. Time has already run out on steel consuming industries. Unemployment and hardship are growing by leaps and bounds. Scores of manufacturing plants are being forced to close their doors on idle machines. But worse than the ghost plants is the abrupt unemployment of hundreds of thousands of workers.

At the beginning of the strike THE IRON AGE reported average inventories ranged from 30 to 45 days' steel supply. Some plants had less, some had more. Plants with leaner stockpiles are already closed. The attrition of the strike is now gnawing away at the bulk of the nation's manufacturing.

What Happened to Emergency?—Our defense effort is already suffering. Plants making shells, fuzes, trucks and jeeps for the Armed forces have been forced to curb production. The impact of the strike will be felt on tank assembly lines this week. Jet aircraft production may be hampered long after the strike has ended. This is because some of the highly specialized alloy steel used in jets has a lead time of as much as 6 months or more between its production and final assembly in planes.

Manufacture of civilian products is being brought to its knees too. Most spectacular is the mass layoff of hundreds of thousands of auto workers and workers supplying auto plants. With only a few exceptions, the auto industry will reach a state of almost complete collapse by July 3. Most plants will be open only for token production, if at all, after the holiday weekend. Prior to this week production of autos had slumped only slightly because assembly plants were the last to shut down. Parts on hand are now nearing exhaustion. And steel pipelines are empty.

Self Help—Steel consumers are using all possible ingenuity to soften the impact of the strike. Vacation and inventory shutdowns are being re-scheduled to shorten down time. Steel substitutions are being made wherever possible. Slitting and shearing operations are helping to more fully utilize stocks on hand. Conversion and gray market sources are being tapped—for what they are worth.

Even if by some miracle a settlement could be reached this week, the worst impact of the strike is still to come. After production is resumed it will take 2 weeks or more to resume the flow of steel to even the highest priority users. After that it will take time to again fill the empty steel supply lines—including those of parts suppliers and subcontractors. The Controlled Materials Plan has become so much paper work, as far as steel is concerned.

Attack MLR—Signing of Pittsburgh Steel by the United Steelworkers pierced the industry's outer perimeter of defense against the union shop. It also was the signal for an all-out union assault against the industry's main line of resistance—The Big Six.

The Big Six are U. S. Steel, Bethlehem, Republic, Jones & Laughlin, Youngstown Sheet & Tube, and Inland. Signing one of these would probably crack the industry's front against compulsory union membership. The union effort is encouraged by a near miss on one of The Big Six about 10 days ago. An optimistic report on that passed to the White House has put the union on the spot to reach an agreement — soon. Meanwhile, President Truman is clutching a political chestnut labeled Taft-Hartley Act.

No Coal Trouble—John L. Lewis, never at a loss for coal bargaining strategy, has decided to wait this one out. There isn't likely to be an impasse in the coal mines in the near future for these reasons: (1) No down-to-earth negotiations have yet taken place. (2) Coal stocks above ground are greater now than at any time in recent years. (3) The steel strike has cost the coal industry a million and a half tons of business a week. (4) The strike in the ore mines has cut shipments of coal to the West and Northwest. (5) Many miners are working only 1 or 2 days a week.

Best guess is that Mr. Lewis will wait for a much better time to bargain for something substantial. When the time is right an amicable settlement can probably be reached.

Scrap Composite Dips — THE IRON AGE Steel Scrap Composite Price lost 33¢ this week—in addition to last week's drop. It is now $39.17 as compared to $39.50 last week. The retreat was based on lower prices for No. 1 heavy melting scrap in Pittsburgh where a sale pegged the price at $38.50—a skid of $4 from last week. This was partly offset by a gain in Philadelphia by Fairless Works' buying.

Steelmaking operations this week are scheduled at 13.5 pct of rated capacity, up 1 point from last week. By week's end 11.4 million tons of steel output will have been lost.

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	July 1, 1952	June 24, 1952	June 3, 1952	July 3, 1951
Hot-rolled sheets	3.60	3.60	3.60	3.60
Cold-rolled sheets	4.35	4.35	4.35	4.35
Galvanized sheets (10 ga)	4.80	4.80	4.80	4.80
Hot-rolled strip	3.50	3.50	3.50	3.50
Cold-rolled strip	4.75	4.75	4.75	4.75
Plate	3.70	3.70	3.70	3.70
Plates wrought iron	.7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	36.75	36.75	36.75	36.75
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb.) cokes	$8.70	$8.70	$8.70	$8.70
Tinplate, electro (0.50 lb.)	7.40	7.40	7.40	7.40
Special coated mfg. ternes	7.50	7.50	7.50	7.50
Bars and Shapes: (cents per pound)				
Merchant bars	3.70	3.70	3.70	3.70
Cold finished bars	4.55	4.55	4.55	4.55
Alloy bars	4.30	4.30	4.30	4.30
Structural shapes	3.65	3.65	3.65	3.65
Stainless bars (No. 302)	31.50	31.50	31.50	31.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire (cents per pound)				
Bright wire	4.85	4.85	4.85	4.85
Rails (dollars per 100 lb)				
Heavy rails	$3.60	$3.60	$3.60	$3.60
Light rails	4.00	4.00	4.00	4.00
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$56.00	$56.00	$56.00	$56.00
Slabs, rerolling	56.00	56.00	56.00	56.00
Forging billets	66.00	66.00	66.00	66.00
Alloy blooms, billets, slabs	70.00	70.00	70.00	70.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	4.10	4.10	4.10	4.10
Skelp	3.35	3.35	3.35	3.35

Price advances over previous week are printed in Heavy Type; declines appear in *Italics.*

Pig Iron: (per gross ton)	July 1, 1952	June 24, 1952	June 3, 1952	July 3, 1951
Foundry, del'd Phila.	$58.19	$58.19	$58.19	$57.77
Foundry, Valley	52.50	52.50	52.50	52.50
Foundry, Southern, Cin'ti	55.58	55.58	55.58	55.58
Foundry, Birmingham	48.88	48.88	48.88	48.88
Foundry, Chicago†	52.50	52.50	52.50	52.50
Basic, del'd Philadelphia	57.27	57.27	57.27	56.92
Basic, Valley furnace	52.00	52.00	52.00	52.00
Malleable, Chicago†	52.50	52.50	52.50	52.50
Malleable, Valley	52.50	52.50	52.50	52.50
Charcoal, Chicago	70.56	70.56	70.56	70.56
Ferromanganese‡	186.25	186.25	186.25	186.25

†The switching charges for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy pages.

Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	*$38.50*‡	$42.50‡	$43.00*	$44.00*
No. 1 steel, Phila. area	40.50‡	37.50‡	41.50*	42.50*
No. 1 steel, Chicago	38.50‡	38.50‡	41.50*	42.50*
No. 1 bundles, Detroit	41.15*	41.15*	41.15*	41.15*
Low phos., Young'n	46.50*	46.50*	46.50*	46.50*
No. 1 cast, Pittsburgh	*42.00*‡	45.50‡	45.50‡	49.00†
No. 1 cast, Philadelphia	38.50‡	38.50‡	38.50‡	49.00†
No. 1 cast, Chicago	40.50‡	40.50‡	43.00‡	49.00†

*Basing Pt. †Shipping Pt.
Not including broker's fee after Feb. 7, 1951.
‡Del'd, includes broker's fee.

Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75	$14.75	$14.75	$14.75
Foundry coke, prompt	17.75	17.75	17.75	17.75

Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	24.50	24.50	24.50	24.50
Copper, Lake, Conn.	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.215	$1.215	$1.215	$1.06
Zinc, East St. Louis	15.00	15.00	17.50	17.50
Lead, St. Louis	*15.30*	15.80*	14.80	16.80
Aluminum, virgin	19.00	19.00	19.00	19.00
Nickel, electrolytic	59.58	59.58	59.58	59.58
Magnesium, ingot	24.50	24.50	24.50	24.50
Antimony, Laredo, Tex.	39.00	39.00	39.00	42.00

*Revised

Composite Prices

[Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)]

	Finished Steel Base Price	Pig Iron	Scrap Steel
July 1, 1952	4.131¢ per lb.	$52.77 per gross ton	*$39.17* per gross ton
One week ago	4.131¢ per lb.	52.77 per gross ton	39.50 per gross ton
One month ago	4.131¢ per lb.	52.77 per gross ton	42.00 per gross ton
One year ago	4.131¢ per lb.	52.69 per gross ton	43.00 per gross ton

	Finished Steel Base Price High		Finished Steel Base Price Low		Pig Iron High		Pig Iron Low		Scrap Steel High		Scrap Steel Low	
1952	4.131¢	Jan. 1	4.131¢	Jan. 1	$52.77	May 2	$52.72	Jan. 1	$42.00	Jan. 1	$39.17	July 1
1951	4.131¢	Jan. 2	4.131¢	Jan. 2	52.72	Oct. 9	52.69	Jan. 2	47.75	Jan. 30	42.00	Oct. 23
1950	4.131¢	Dec. 1	3.837¢	Jan. 3	52.69	Dec. 12	45.88	Jan. 3	45.13	Dec. 19	26.25	Jan. 3
1949	3.837¢	Dec. 27	3.705¢	May 3	46.87	Jan. 18	45.88	Sept. 6	43.00	Jan. 4	19.33	June 28
1948	3.721¢	July 27	3.193¢	Jan. 1	46.91	Oct. 12	39.58	Jan. 6	43.16	July 27	39.75	Mar. 9
1947	3.193¢	July 29	2.848¢	Jan. 1	37.98	Dec. 30	30.14	Jan. 7	42.58	Oct. 28	29.50	May 20
1946	2.848¢	Dec. 31	2.464¢	Jan. 1	30.14	Dec. 10	25.37	Jan. 1	31.17	Dec. 24	19.17	Jan. 1
1945	2.464¢	May 29	2.396¢	Jan. 1	25.37	Oct. 23	23.61	Jan. 2	19.17	Jan. 2	18.92	May 22
1944	2.396¢		2.396¢		$23.61		$23.61		19.17	Jan. 11	15.76	Oct. 24
1943	2.396¢		2.396¢		23.61		23.61		$19.17		$19.17	
1942	2.396¢		2.396¢		23.61		23.61		19.17		19.17	
1941	2.396¢		2.396¢		$23.61	Mar. 20	$23.45	Jan. 2	$22.00	Jan. 7	$18.92	May 22
1940	2.30467¢	Jan. 2	2.24107¢	Apr. 16	23.45	Dec. 23	22.61	Jan. 2	21.83	Dec. 30	16.04	Apr. 9
1939	2.35367¢	Jan. 3	2.27207¢	May 16	22.61	Sept. 19	20.61	Sept. 12	22.50	Oct. 3	14.08	May 16
1938	2.58414¢	Jan. 4	2.27207¢	Oct. 18	23.25	June 21	19.61	July 6	15.00	Nov. 22	11.00	June 7
1937	2.58414¢	Mar. 9	2.32263¢	Jan. 4	32.25	Mar. 9	20.25	Feb. 16	21.92	Mar. 30	12.67	June 9
1936	2.32263¢	Dec. 28	2.05200¢	Mar. 10	19.74	Nov. 24	18.73	Aug. 11	17.75	Dec. 21	12.67	June 8
1929	2.31773¢	May 28	2.26498¢	Oct. 29	18.71	May 14	18.21	Dec. 17	17.58	Jan. 29	14.08	Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Market Briefs

Defense Steel Shipped—Two shipments of steel passed picket lines in Chicago last week. Inland Steel, Indiana Harbor, shipped 19 tons of channels and other materials to a jet engine plant. Second shipment was from a U. S. Steel Supply Co. warehouse at Gary. Order consisted of 20 truckloads of steel, totaling 200 tons. It was sent to producers in the northern Illinois-Indiana area.

U. S. Aluminum—Any increased supplies of aluminum should come from U. S. production, rather than from foreign purchases, according to the long-awaited report from the Senate-House Committee on Defense Production. Committee's report is expected to carry considerable weight in the forthcoming government decision as to whether to embark upon a new round of domestic aluminum capacity expansion or to enter into long-range contracts with Aluminum Company of Canada. The committee doubts the Alcan contract could ever be of any real benefit to us especially in the crucial years 1952-1954.

Quota Boost—July copper allocations will be raised to 133,333 tons from a second quarter monthly average of 101,000 tons. Action is based on expected increase in foreign copper shipments resulting from the new pricing formula. Brass mills will get 37,327 tons of domestic copper and entitlements to 24,884 tons of imported supplies. Wire mills will receive 63,722 tons in all on the 60-40 ratio setup.

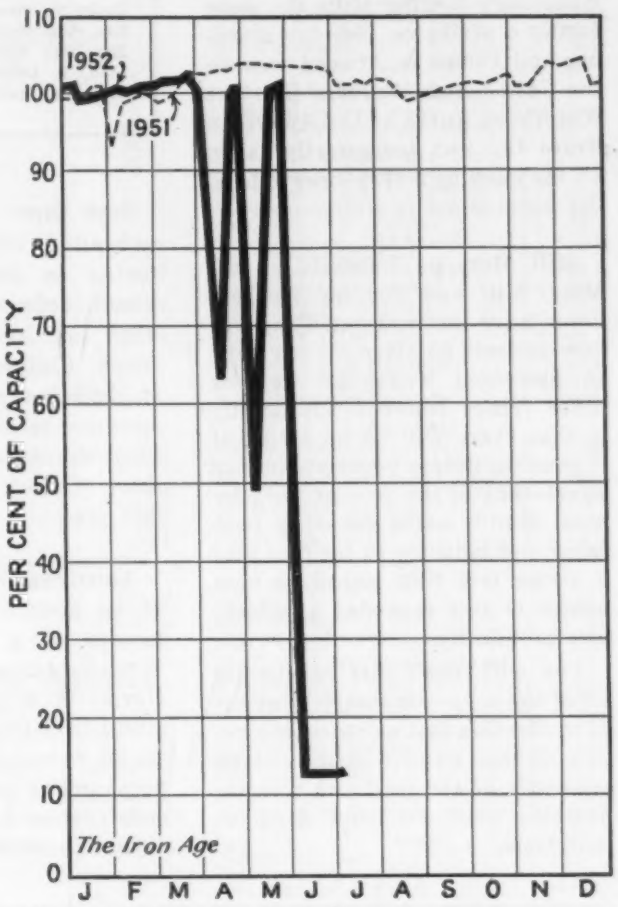
Cryolite Subsidy—Supply of cryolite will be doubled in the next year as a result of government agreement to subsidize 13,700 tons at a rate of $70 a ton. In a three-way agreement involving Danish-owned mines in Greenland, Pennsylvania Salt Mfg. Co. and Defense Materials Procurement Agency, the Danish company agreed to expand operations provided the extra cost was defrayed through a premium price.

No Gas Cut—Detroit industry is assured a continued supply of natural gas. Federal Power Commission has refused to allow Panhandle Eastern Pipe Line Co. to reduce its deliveries by 37.5 million cu ft daily. Such a cutback would have forced a $12 million expansion in gas facilities by customer companies with the cost being passed on to consumers.

Lift Controls—In what it termed a "temporary" action, National Production Authority suspended inventory controls on both copper and aluminum. Orders may not be placed, however, in excess of allocations, and this is expected to prevent deliberate hoarding. But if necessary, ceilings could be reimposed and holders forced to reduce their stocks.

Moly Prices Cut—New prices for seamless molybdenum tubing are 11 to 46 pct lower than the earlier prices. Fansteel Metallurgical Corp. lists 91 standard diameters and wall thicknesses from 1/16 in. to 1 in. Product was commercially introduced only 2 yeas ago.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
June 22	3.0	7.5	7.0	14.5	27.5	0.5	0.0	40.0	52.0	3.5	36.7	22.0	14.0	12.5
June 29	6.0	7.0	7.0	16.0	28.0	0.5	0.0	40.0	51.0	3.5	36.5	50.0	14.0	13.5

Beginning Jan. 1, 1952, operations are based on annual capacity of 108,587,670 net tons.
* Revised.

Brass Labor Troubles Mounting

Several Connecticut Valley plants already struck . . . Others face strikes . . . Mine, Mill union contract expires . . . Propose West Virginia aluminum reduction plant—*By R. L. Hatschek.*

Strikes and strike threats in the brass industry are on the upswing. Scovill Mfg. Co., Bristol Brass Corp., and Seymour Mfg. Co. were already affected by strikes and more were on the way. Then the Waterbury Companies, Inc. and A. H. Well's Co. were struck.

Another Scovill plant and Waterbury Rolling Mills Co. were facing a strike on Monday morning and Plume & Atwood was on the United Auto Workers' list. The Waterbury works of the American Brass Co. was temporarily taken off the hook by a very close vote of the workers not to strike—yet.

Still More — Contracts of the Mine, Mill and Smelter Workers union have just run out. They will now actively go after 25¢ per hour in increased wages as well as other fringe benefits. Probability is that there will be no strike of this union unless negotiations fall apart—but in the face of the adamant stands being taken by both labor and industry so far this year a strike late this month or next month is now regarded as a definite possibility.

You will recall that practically all of the copper industry went out of production last summer as a result of this union's strike. Large segments of the lead and zinc industries were also shut down at that time.

MONTHLY AVERAGE PRICES

The average prices of the major nonferrous metals in June based on quotations appearing in THE IRON AGE, were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley	24.50
Lake copper, delivered	24.625
Straits tin, New York	$1.215
Zinc, East St. Louis	15.74
Zinc, New York	16.57
Lead, St. Louis	15.26
Lead, New York	15.06

Seek More Copper—With this unhealthy set of circumstances facing an industry vital to national defense, Washington officials are attempting to get as much Chilean copper into the stockpile as possible. Should the situation become critical, the President could then authorize the release of stockpile metal as he did last year.

Aluminum Prospects—The idea of an aluminum reduction plant located on a navigable river in West Virginia looks good to Sen. Harley M. Kilgore, D., W. Va. He states that President Truman has shown "great interest" in the proposal and he has been assured that construction can be started at an early date if the U. S. does not enter any long-term agreements for Canadian aluminum.

Sen. Kilgore said he had been assured that such a plant could be built as quickly as one in Canada and would be "several thousand miles farther from Russian air bases than a plant in British Columbia," site of the Canadian project. A domestic plant would also be much closer to the source of bauxite.

Stock Offer—One feature of the proposal is said to be the assurance that fabricators would be given a chance to buy stock in proportion to their aluminum needs. They would be offered supply contracts covering a portion of their needs over a term of years. A number of consumers have already shown interest, said the Senator.

Electric power for smelting the metal would be generated by coal-fired steam plants in what Sen. Kilgore called a new process at no higher—and possibly lower cost—than hydroelectric plants. He added that he had been told adequate supplies of fuel, power and bauxite would be available.

Tariffs—Import tariffs on lead and lead ore were reinstated last week by the President and those on zinc and zinc ore can be expected shortly. The latter must be reimposed by Aug. 4 but many people expect the Tariff Commission to notify Mr. Truman of the June average price early, thus hastening his action. It is expected that the suspension of tariffs on lead and zinc scrap will both be extended.

Decontrolled — Zinc has now been completely freed from controls by the National Production Authority. M-9 was revoked last week. This ended the inventory control which was the last still in effect on the metal. NPA's Regulation 1 was amended also by deletion of slab zinc this week. But the zinc market remains in the doldrums of the steel strike.

NONFERROUS METAL PRICES

	June 25	June 26	June 27	June 28	June 30	July 1
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.215	$1.215	$1.215	....	$1.215	$1.215
Zinc, East St. Louis	15.00	15.00	15.00	15.00	15.00	15.00
Lead, St. Louis	15.80	15.80	15.80	15.80	15.80	15.80

Note: Quotations are going prices.

Nonferrous Prices

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 20,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 61S-O, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 75S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 4S, 61S-O, 33.5¢; 52S, 35.6¢; 24S-O, 24S-OAL, 34.1¢; 75S-O, 75S-OAL, 41.8¢; 0.032 in., 2S, 3S, 32.9¢; 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.

Plate ¼ in. and heavier: 2S, 3S-F, 28.3¢; 4S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 24S-OAL, 32.4¢; 75S-O, 75S-OAL, 38.8¢.

Extruded Solid Shapes: shape factors 1 to 5, 30.2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 26, 39.6¢ to $1.16; 36 to 38, 47.2¢ to $1.70.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢ to 38.5¢; cold finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5¢ to 35¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛ to 11/32 in., 53.5¢ to 42¢; ⅜ to 1½ in., 41.5¢ to 39¢; 1 9/16 to 3 in., 38.5¢ to 36¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 39.5¢ to 29¢; 52S, 48¢ to 35¢; 56S, 51¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 75S-T6, 84¢ to 67.5¢.

Extruded Tubing, Rounds: 63S-ST-5, OD in in.: 1¼ to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., $1.42; 96 in., $1.522; 120 in., $1.902; 144 in., $2.284. Gage 0.24 x 28 in., 72 in., $1.379; 96 in., $1.839; 120 in., $2.299; 144 in., $2.759. **Coiled Sheet:** 0.019 in. x 28 in., 28.2¢ per lb; 0.024 in. x 28 in., 26.9¢ lb.

Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in., 63¢; 3/16 in., 65¢; ⅛ in., 67¢; B & S Gage 10, 68¢; 12, 72¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311 in., 74¢; ½ to ¾ in., 57.5¢; 1¼ to 1.749 in., 53¢; 2½ to 5 in., 48.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057: ¼ in. to 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76¢; 0.165 to 0.219, ⅝ to ⅞, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 *lb base, f.o.b. mill*)

Commercially pure and alloy grades: Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	77	60½
Strip, cold-rolled	83	63½
Rods and bars	73	58½
Angles, hot-rolled	73	58½
Plates	75	59½
Seamless tubes	106	93½
Shot and blocks	..	53½

Copper, Brass, Bronze

(Freight prepaid on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper	41.68	....	41.28
Copper, h-r	....	37.53	....
Copper, drawn	....	38.78	....
Low brass	39.67	39.36	....
Yellow brass	38.28	37.97	....
Red brass	40.14	39.83	....
Naval brass	43.20	37.26	38.52
Leaded copper	....	41.58	....
Com'l bronze	41.13	40.82	....
Mang. bronze	46.92	40.81	42.37
Phos. bronze	61.07	61.32	....
Muntz metal	41.18	36.74	37.99
Ni silver, 10 pct	49.82	52.04	....

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	19.00
Aluminum pig	18.00
Antimony, American, Laredo, Tex.	39.00
Beryllium copper, 3.75-4.25% Be	$1.56
Beryllium aluminum 5% Be, Dollars per lb contained Be	$69.50
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.25
Cobalt, 97-99% (per lb)	$2.40 to $2.47
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$200
Lead, St. Louis	15.80
Lead, New York	16.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb.	24.50
Magnesium, sticks, 100 to 500 lb.	42.00 to 44.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$192-195
Nickel electro, f.o.b. N. Y. warehouse	59.58
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	52.75
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $93
Silver, New York, cents per oz.	82.75
Tin, New York	$1.215
Titanium, sponge	$5.00
Zinc, East St. Louis	15.00
Zinc, New York	15.83
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	27.25
No. 120	26.75
No. 123	26.25
80-10-10 ingot	
No. 305	33.00
No. 315	30.50
88-10-2 ingot	
No. 210	41.50
No. 215	40.00
No. 245	34.50
Yellow ingot	
No. 405	23.25
Manganese bronze	
No. 421	30.50

Aluminum Ingot

(Cents per lb, 10,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	20.6
0.60 copper, max.	20.4
Piston alloys (No. 122 type)	21.2
No. 12 alum. (No. 2 grade)	19.5
108 alloy	20.6
195 alloy	20.8
13 alloy	20.8
ASX-679	20.5

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	18.80
Grade 2—92-95%	18.60
Grade 3—90-92%	18.40
Grade 4—85-90%	18.20

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	37.84
Electrodeposited	33¾
Flat rolled	38.34
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	26½
Ball, anodes	25½
Nickel, 99 pct plus	
Cast	76.00
Rolled, depolarized	77.00
Cadmium	$2.40
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	97½

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	53
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	20½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz.	67¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21½	20¾
Yellow brass	19½	17⅞
Red brass	20½	19⅝
Comm. bronze	20½	19¾
Mang. bronze	18½	17¾
Brass rod ends	18⅞	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
Refinery brass	17.25*
Radiators	14.75

* Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
No. 1 composition	18.50
No. 1 comp. turnings	18.25
Rolled brass	15.50
Brass pipe	16.50
Radiators	14.75
Aluminum	
Mixed old cast	9.75
Mixed new clips	11.00
Mixed turnings, dry	9.50
Pots and pans	9.25

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire.	18¾—19¼
No. 2 heavy copper and wire.	17 —17½
Light copper	15½—16
New type shell cuttings	15½—16
Auto radiators (unsweated)	14 —14¼
No. 1 composition	17½—18
No. 1 composition turnings	17 —17½
Unlined red car boxes	16½—17
Cocks and faucets	15 —15⅛
Mixed heavy yellow brass	11½—12
Old rolled brass	14½—15
Brass pipe	15½—16
New soft brass clippings	16 —16½
Brass rod ends	15½—16
No. 1 brass rod turnings	15 —15½

Aluminum

Alum. pistons and struts	6 — 6½
Aluminum crankcases	7 — 7½
2S aluminum clippings	10
Old sheet and utensils	7 — 7½
Borings and turnings	5 — 6
Misc. cast aluminum	7 — 7½
Dural clips (24S)	7 — 7½

Zinc

New zinc clippings	8
Old zinc	6
Zinc routings	3 — 3½
Old die cast scrap	5 — 5½

Nickel and Monel

Pure nickel clippings	35 —36
Clean nickel turnings	35 —36
Nickel anodes	35 —36
Nickel rod ends	35 —36
New Monel clippings	28 —29
Clean Monel turnings	20 —21
Old sheet Monel	28 —29
Nickel silver clippings, mixed	13 —14
Nickel silver turnings, mixed	12 —13

Lead

Soft scrap, lead	12 —12¼
Battery plates (dry)	7 — 7½
Batteries, acid free	4 — 5

Magnesium

Segregated solids	15 —16
Castings	14 —15

Miscellaneous

Block tin	100 —110
No. 1 pewter	70
No. 1 auto babbitt	55 —60
Mixed common babbitt	14½—14¾
Solder joints	19 —20
Siphon tops	60
Small foundry type	19 —19½
Monotype	15½—16
Lino. and stereotype	13½—14
Electrotype	12 —12½
Hand picked type shells	9¾—10
Lino. and stereo. dross	7
Electro. dross	6½

Will Larger Sales Stiffen Prices?

Small distress sales can tumble prices . . . But larger sales may have stiffening effect . . . Some expect below-ceiling selling after strike—temporarily . . . Future outlook good.

Strength of the scrap market remained asleep under the anaesthetic of the steel strike. Distress sales of small tonnages have forced drastic below-ceiling price reductions in some districts. But these prices may not hold when larger sales take the forefront.

A hypo to the market in the East Coast was Fairless Works buying of No. 2 heavy melting and No. 2 bundles at $38 delivered. Previously, small distress sales by dealers forced to unload had dragged prices dollars below the new level. Scrap — expected to be of good quality — is being delivered to Fairless Works stockpile yards this week.

This can be taken as evidence that as soon as mills start buying in quantity again the scrap market will enjoy a stiffening of its price structure. Some of the very optimistic expect it to bounce back to ceiling. Others spoof at this outlook, explaining that the market will make only a modified advance. It will firm up at below ceiling for most grades until huge mill stockplies slim down and scrap sources prove less fertile.

Many mill purchasing agents, while willing to play price poker to a limited extent, do not want to see scrap prices tumble too sheerly. They fear a winter shortage ahead and want to keep scrap sources wide open.

Pittsburgh—On the basis of a sale, openhearth grades dropped $4 per ton in this district. The sale pegged No. 1 heavy melting steel and No. 1 bundles at $38-$39 per ton delivered, No. 2 steel and No. 2 bundles at $37-$38. Railroad scrap and good low phos were the only grades still bringing ceiling prices. Agreement was general that OPS ceilings were largely out the window. No one was pretending otherwise.

Chicago — Market continued slow here with reports that electric furnace was being offered at $2 below ceiling prices to mills, but no sales had been reported at press time. There was one report that several inquiries had been received on cast scrap, but the majority of dealers reported small interest. Collections of industrial scrap were slowing slightly. Blast furnace grades continued to move slowly if at all. A few consumers were again accepting scrap deliveries under old orders.

Philadelphia—Biggest news in the scrap trade this week is that the Fairless Works has come into the market. This stabilized the market for No. 2 steel and No. 2 bundles at $38 a ton. New mill was open for shipments as of July 2. Other business brought No. 1 grades up to a range of $40 to $41. Activity at yard level is practically dead and industrial scrap is way off as a result of the steel strike.

New York—Scrap is being delivered this week to U. S. Steel's Fairless Works for stockpiling. Sales were for No. 2 heavy melting and bundles at $38 per ton delivered. A smaller buyer conformed to this price —perhaps $1 higher. Even this below-ceiling sale was a hypo. But generally the market was depressed. Below-ceiling prices prevailed for nearly all grades. Chemical boring sales have been reduced to a fraction.

Detroit—Steel strike doldrums still held the market calm. Most grades were going below ceiling with a few exceptions. These grades are not generated in large quantities so no surplus exists even with the strike underway. Two electric furnaces and Ford's openhearth operating keep the market from a complete standstill. Slight tightening in cast was a minor development.

Cleveland — Market activity in Cleveland and Youngstown areas was limited mostly to sparring on all sides in an effort to feel out the market. Mill sources report offerings below ceiling on openhearth dealer material on a restricted basis. For the most part mills having ample inventories are holding out against these offers. One blast furnace consumer intends to remain out of the market through July. Some brokers are willing to sell below ceiling on blast furnace and openhearth grades. Prices on these grades were lower this week on an appraisal of market conditions.

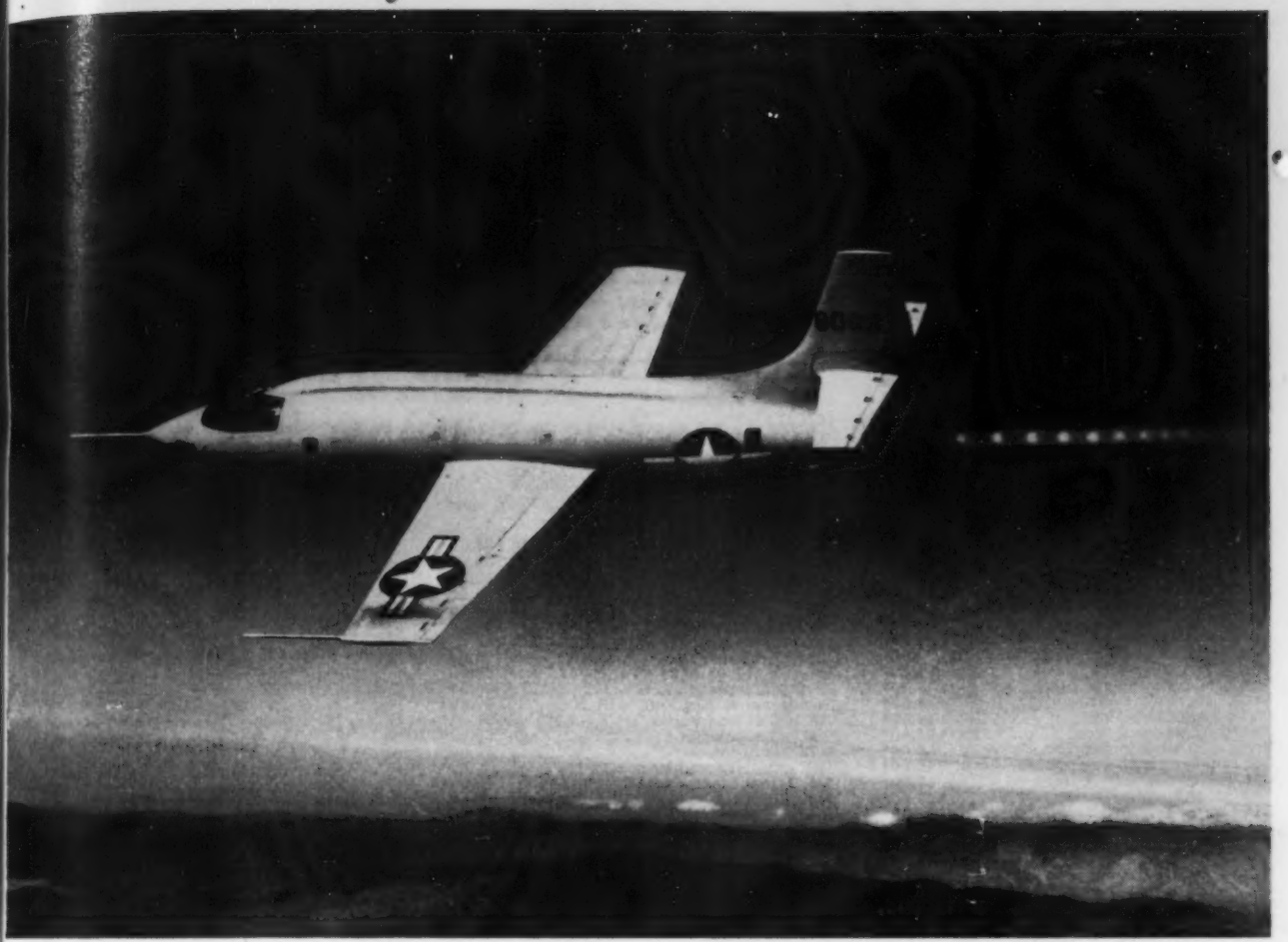
St. Louis — Two distress sales of about 1000 tons each of No. 1 and 2 heavy melting steel were made at $40 and $37, respectively. No sales of No. 2 bundles were made. Mill that bought the heavy melting at $37 is said to have refused bundles at $35. Sales of some other items were below ceiling. Mills are limiting springboards.

Birmingham — Considerable cast scrap is moving North and one Birmingham cast iron pipe foundry was in the market this week for a sizeable amount. Many dealers, however, still are reluctant to sell at the prices offered. Despite brokers' warnings that the price may go lower, these dealers hold on to the belief it will advance again. Some electric furnace scrap is being sold at ceiling prices.

Cincinnati—One mill in the area reaching desired inventory goals will be buying scrap during July for consumption only. Openhearth grades and turnings will go at ceiling prices delivered mostly from local sources. Some good earmarked industrial scrap may still bring ceilings plus freight but miscellaneous industrial scrap will only command ceiling delivered prices. Emphasis continues to be on quality in view of the easing market. Mills are not reaching out of the local area for turnings or No. 2 bundles: No. 2 bundles are the weakest of the openhearth grades.

West Coast—Scrap prices are remaining firm because only three mills in the West are buying—and these in relatively small quantities. Many yards are laying off workers. Prices are expected to dip after strike settlement because dealers need capital.

Buffalo — Record accumulations of scrap are reported in dealers' yards and in barges. Openhearth and cast grades stay $5 to $6 below ceilings. Industrial scrap intake is slowing. Movement is very slow.



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Scrap Prices

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

*Scrap at basing point ceiling.

†Scrap at shipping point ceiling.

Pittsburgh

No. 1 hvy. melting	$38.00 to	$39.00
No. 2 hvy. melting	37.00 to	38.00
No. 1 bundles	38.00 to	39.00
No. 2 bundles	37.00 to	38.00
Machine shop turn.	27.00 to	27.50
Mixed bor. and ms. turns.	27.00 to	27.50
Shoveling turnings	....	33.00
Cast iron borings	32.00 to	33.00
Low phos. punch'gs, plate	....	46.50*
Heavy turnings	35.00 to	36.00
No. 1 RR. hvy. melting	....	46.00*
Scrap rails, random lgth.	....	48.00*
Rails 2 ft and under	....	52.00*
RR. steel wheels	....	51.00*
RR. spring steel	....	51.00*
RR. couplers and knuckles	....	51.00*
No. 1 machinery cast.	....	52.00
Cupola cast.	....	42.00
Heavy breakable cast.	....	45.00
Malleable	....	50.00

Chicago

No. 1 hvy. melting	$38.00 to	$39.00
No. 2 hvy. melting	38.00 to	39.00
No. 1 factory bundles	41.00 to	42.00
No. 1 dealers' bundles	41.00 to	42.00
No. 2 dealers' bundles	38.00 to	39.00
Machine shop turn.	25.50 to	27.00
Mixed bor. and turn.	30.00 to	31.00
Shoveling turnings	30.00 to	31.00
Cast iron borings	30.00 to	31.00
Low phos. forge crops	....	51.50*
Low phos. punch'gs, plate	....	45.00*
No. 1 RR. hvy. melting	....	44.50*
Scrap rails, random lgth.	....	46.50*
Rerolling rails	....	51.50*
Rails 2 ft and under	....	50.50*
Locomotive tires, cut	....	49.50*
Cut bolsters & side frames	....	47.50*
Angles and splice bars	....	49.50*
RR. steel car axles	....	56.50*
RR. couplers and knuckles	....	49.50*
No. 1 machinery cast	42.00 to	43.00
Cupola cast	40.00 to	41.00
Heavy breakable cast.	35.00 to	36.00
Cast iron brake shoes	....	41.00†
Cast iron car wheels	....	47.00†
Malleable	....	55.00†

Philadelphia

No. 1 hvy. melting	$40.00 to	$41.00
No. 2 hvy. melting	38.00 to	39.00
No. 1 bundles	40.00 to	41.00
No. 2 bundles	38.00 to	39.00
Machine shop turn.	27.00 to	28.00
Mixed bor. and turn.	29.00 to	30.00
Shoveling turnings	29.00 to	30.00
Clean cast chem. borings	34.00 to	34.50
Low phos. punch'gs, plate	....	45.00*
Low phos. 3 ft and under	....	45.50*
Low phos. bundles	....	44.50*
Hvy. trimmings	....	41.50*
RR. steel wheels	....	49.50*
RR. spring steel	....	49.50*
Rails 18 in. and under	....	52.50*
Cupola cast.	38.00 to	39.00
Heavy breakable cast.	41.00 to	42.00
Cast iron carwheels	....	47.00†
Malleable	....	55.00†
Unstripped motor blocks	34.00 to	35.00
Clean auto cast.	45.00 to	46.00
Charging box cast.	39.00 to	40.00

Cleveland

No. 1 hvy. melting	$40.00 to	$41.00
No. 2 hvy. melting	39.00 to	40.00
No. 1 busheling	40.00 to	41.00
No. 1 bundles	40.00 to	41.00
No. 2 bundles	39.00 to	40.00
Machine shop turn.	27.00 to	28.00
Mixed bor. and turn.	31.00 to	32.00
Shoveling turnings	31.00 to	32.00
Cast iron borings	31.00 to	32.00
Low phos. 2 ft and under	....	48.00*
No. 1 RR. hvy. melting	....	45.00*
Rails 3 ft and under	....	50.00*
Rails 18 in. and under	....	53.00*
No. 1 machinery cast.	48.50 to	49.50
Cast iron carwheels	....	47.00†
Stove plate	45.00 to	46.00
Malleable	51.00 to	52.00

Youngstown

No. 1 hvy. melting	$41.00 to	$42.00
No. 2 hvy. melting	40.00 to	41.00
No. 1 bundles	41.00 to	42.00
No. 2 bundles	40.00 to	41.00
Machine shop turn.	28.00 to	29.00
Shoveling turnings	32.00 to	33.00
Cast iron borings	32.00 to	33.00
Low phos. plate	....	46.50*

Buffalo

No. 1 hvy. melting	$37.00 to	$38.00
No. 2 hvy. melting	37.00 to	38.00
No. 1 bushelings	38.00 to	39.00
No. 1 bundles	38.00 to	39.00
No. 2 bundles	37.00 to	38.00
Machine shop turn.	28.00 to	29.00
Mixed bor. and turn.	32.00 to	33.00
Shoveling turnings	32.00 to	33.00
Cast iron borings	32.00 to	33.00
Low phos. plate	....	45.50*
Scrap rails, random lgth.	....	47.00*
Rails 2 ft and under	....	51.00*
RR. steel wheels	....	50.00*
RR. spring steel	....	50.00*
RR. couplers and knuckles	....	50.00*
No. 1 machinery cast.	....	45.00†
No. 1 cupola cast.	40.00 to	41.00
Small indus. malleable	....	55.00†

Birmingham

No. 1 hvy. melting	....	$38.00*
No. 2 hvy. melting	....	38.00*
No. 1 bundles	....	39.00
Electric furnace bundles	....	41.00
No. 2 bundles	....	38.00*
No. 1 busheling	....	39.00*
Machine shop turn.	....	29.00*
Shoveling turnings	....	33.00*
Cast iron borings	....	33.00*
Bar crops and plate	....	44.00*
Structural and plate, 2 ft.	....	44.00*
No. 1 RR. hvy. melting	....	41.00*
Scrap rails, random lgth.	....	43.00*
Rerolling rails	....	48.00*
Rails 2 ft and under	....	47.00*
Angles & splice bars	....	46.00*
Std. steel axles	....	53.00*
No. 1 cupola cast.	$40.00 to	41.00
Stove plate	36.00 to	37.00
Cast iron carwheels	....	47.00†
Charging box cast.	39.00 to	40.00
Heavy breakable	36.00 to	37.00
Drop broken machinery	42.00 to	43.00
Unstripped motor blocks	35.00 to	36.00

St. Louis

No. 1 hvy. melting	$37.50 to	$40.00
No. 2 hvy. melting	37.50 to	40.00
No. 2 bundled sheets	....	35.00
Machine shop turn.	....	26.00
Shoveling turnings	....	28.00
Rails, random lengths	....	45.00*
Rails 3 ft and under	....	48.00*
Locomotive tires, uncut	....	45.00*
Angles and splice bars	....	48.00*
Std. steel car axles	....	55.00*
RR. spring steel	....	48.00*
Cupola cast.	....	40.00
Hvy. breakable cast.	....	38.00
Cast iron brake shoes	....	38.00
Stove plate	....	42.00
Cast iron car wheels	....	47.00†
Malleable	....	55.00†

New York

Brokers' Buying prices per gross ton, on cars:

No. 1 hvy. melting	$33.00 to	$34.00
No. 2 hvy. melting	31.50 to	32.50
No. 2 bundles	31.50 to	32.50
Machine shop turn.	19.50 to	20.50
Mixed bor. and turn.	22.00 to	22.50
Shoveling turnings	22.00 to	22.50
No. 1 machinery cast.	40.00 to	41.00
Mixed yard cast.	33.00 to	35.00
Charging box cast.	36.00 to	38.00
Heavy breakable cast.	33.00 to	35.00
Unstrp. motor blocks	29.00 to	30.00

Boston

Brokers' Buying prices per gross ton, on cars:

No. 1 hvy. melting	$27.00 to	$28.00
No. 2 hvy. melting	27.00 to	28.00
No. 1 bundles	28.00 to	29.00
No. 2 bundles	27.00 to	28.00
Machine shop turn.	....	17.00
Mixed bor. and turn.	....	17.00
Shoveling turnings	....	19.00
No. 1 busheling	27.00 to	28.00
Clean cast chem. borings	....	25.00
Mixed cupola cast.	30.00 to	32.00
Heavy breakable cast.	....	29.00
Stove plate	29.00 to	31.00

Detroit

Brokers' Buying prices per gross ton, on cars:

No. 1 hvy. melting	....	$39.20*
No. 2 hvy. melting	....	34.00
No. 1 bundles, openhearth	....	40.20*
No. 1 bundles, electric furnace	....	42.20*
New busheling	....	40.20*
Machine shop turn.	....	23.00
Mixed bor. and turn.	....	29.00
Shoveling turnings	....	29.00
Cast iron borings	....	29.00
Low phos. punch'gs, plate	....	42.70*
No. 1 cupola cast.	....	46.00
Heavy breakable cast.	....	41.00
Stove plate	....	41.00
Automotive cast.	....	46.00
Cast iron brake shoes	....	39.00

Cincinnati

No. 1 hvy. melting	$41.00 to	$42.00
No. 2 hvy. melting	41.00 to	42.00
No. 1 bundles	41.00 to	42.00
No. 2 bundles	40.00 to	42.00
Machine shop turn.	32.00 to	33.00
Mixed bor. and turn.	36.00 to	37.00
Shoveling turnings	36.00 to	37.00
Cast iron borings	36.00 to	37.00
Low phos. plate	....	45.50*
Low phos. 2 ft and under	....	48.00*
Rails, random lengths	....	47.00*
Rails, 18 in. and under	....	53.00*
No. 1 cupola cast.	46.00 to	47.00
Hvy. breakable cast.	39.00 to	40.00
Drop broken cast.	49.00 to	50.00

San Francisco

No. 1 hvy. melting	....	$34.00*
No. 2 hvy. melting	....	34.00*
No. 1 bundles	....	35.00*
No. 2 bundles	....	29.00
Machine shop turn.	....	20.00
Elec. fur. 1 ft and under	....	41.00*
No. 1 RR. hvy. melting	....	37.00*
Scrap rails random lgth.	....	39.00*
No. 1 cupola cast.	....	42.00

Los Angeles

No. 1 hvy. melting	....	$34.00*
No. 2 hvy. melting	....	34.00*
No. 1 bundles	....	35.00*
No. 2 bundles	....	29.00
Mach. shop turn.	....	20.00
Elec. fur. 1 ft and under	....	41.00*
No. 1 RR. hvy. melting	....	37.00*
Scrap rails, random lgth.	....	39.00*
No. 1 cupola cast.	....	46.00

Seattle

No. 1 hvy. melting	....	$34.00*
No. 2 hvy. melting	....	34.00*
No. 1 bundles	....	35.00*
No. 2 bundles	....	29.00
Elec. fur. 1 ft and under	....	41.00*
No. 1 RR. hvy. melting	....	37.00*
No. 1 cupola cast.	....	36.50
Heavy breakable	....	32.00

Hamilton, Ont.

No. 1 hvy. melting	....	$35.00
No. 1 bundles	....	35.00
No. 2 bundles	....	34.50
Mechanical bundles	....	33.00
Mixed steel scrap	....	31.00
Mixed bor. and turn.	....	32.00
Rails, remelting	....	35.00
Rails, rerolling	....	33.00
Bushelings	....	30.00
Bush., new fact. prep'd.	....	33.00
Bush., new fact. unprep'd.	....	32.00
Short steel turnings	....	32.00
Cast scrap	....	50.00

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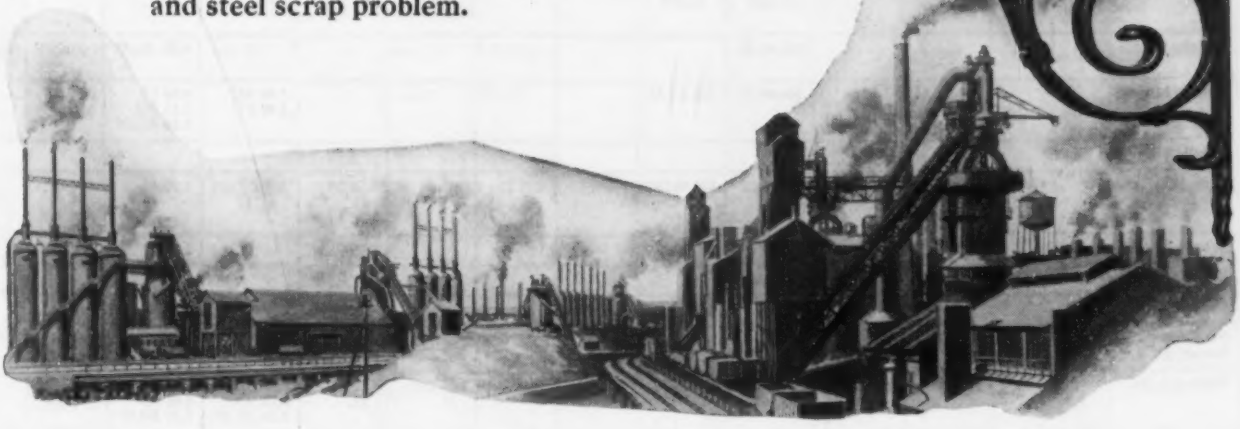

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		INGOTS		BILLETS, BLOOMS, SLABS			PIPE SKELP	PILING	SHAPES STRUCTURALS		STRIP			
		Carbon Forging Net Ton	Alloy Net Ton	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Steel Sheet	Carbon	Hi Str. Low Alloy	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy
EAST	Bethlehem, Pa.					$70.00 *B3*			3.70 *B3*	5.50 *B3*				
	Buffalo, N. Y.			$56.00 *B3*	$66.00 *B3, R3*	$70.00 *B3, R3*		4.45 *B3*	3.70 *B3*	5.50 *B3*	3.50 *B3, R3*	4.65 *B3*	4.95 *B3*	6.40 *B3*
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.				$73.00 *A2*	$77.00 *A2*					3.90 *A2*		5.55 *A2*	
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.			$56.00 *B3*	$66.00 *B3*	$70.00 *B3*			3.70 *B3*	5.50 *B3*	3.50 *B3*			
	Newark, N. J.													
	New Haven, Conn.											5.15 *A5* 5.85 *D1*		
	Phoenixville, Pa.								5.90 *P2*					
	Putnam, Conn.													
	Sparrows Pt., Md.										3.50 *B3*	4.65 *B3*	4.95 *B3*	6.40 *B3*
	Worcester, Mass.													
	Trenton, N. J.											6.00 *R4*		
MIDDLE WEST	Alton, Ill.										3.95 *L1*			
	Ashland, Ky.										3.50 *A7*			
	Canton-Massillon				$66.00 *R3*	$70.00 *R3* $66.00 *T5*								
	Chicago, Ill.			$56.00 *U1*	$66.00 *U1, R3,W8*	$70.00 *U1, R3,W8*		4.45 *U1*	3.65 *U1, W8*	5.50 *U1*	3.50 *A1, W8*	4.90 *A1, I3*		
	Cleveland, Ohio				$66.00 *R3*							4.65 *A5,J3*		6.55 *A5* 6.70 *J3*
	Detroit, Mich.		$54.00 *R5*		$69.00 *R5*	$73.00 *R5*					4.40 *M2* 3.80 *G3*	4.85 *G3* 5.45 *M2* 5.60 *R5,D1*	5.95 *G3*	
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana			$56.00 *U1*	$66.00 *U1*	$70.00 *U1, Y1*		4.45 *I3*	3.65 *U1, I3*	5.50 *U1, I3* 6.00 *Y1*	3.50 *U1, Y1,I3*	4.90 *I3*	5.30 *U1, I3* 5.80 *Y1*	
	Granite City, Ill.													
	Kokomo, Ind.													
	Middletown, Ohio											4.65 *A7*		
	Niles, Ohio Sharon, Pa.										4.00 *S1*	5.35 *S1*	5.40 *S1*	6.55 *S1*
	Pittsburgh, Pa.	$52.00 *U1*	$54.00 *U1, C11*	$56.00 *U1*	$66.00 *U1*	$70.00 *U1, C11*	3.35 *U1* 3.45 *J3*	4.45 *U1*	3.65 *U1, J3*	5.50 *U1, J3*	4.00 *S9,S7* 3.75 *A3* 3.50 *J3,A7*	4.65 *J3,A7* 5.00 *A3* 5.35 *B4,S7*		
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.								3.90 *W3*		3.60 *W3*	4.65 *W3,F3*	5.75 *W3*	7.20 *W3*
	Youngstown, Ohio					$70.00 *Y1, C10*	3.35 *U1, R3*			6.00 *Y1*	3.50 *U1, R3, Y1*	4.65 *R3, Y1* 5.25 *C5,T4* 5.35 *B4*	5.30 *U1, R3* 5.80 *Y1*	6.55 *R3* 7.05 *Y1*
WEST	Fontana, Cal.	$79.00 *K1*	$80.00 *K1*	$75.00 *K1*	$85.00 *K1*	$89.00 *K1*			4.25 *K1*	6.10 *K1*	4.75 *K1*	6.30 *K1*	6.20 *K1*	6.95 *K1*
	Geneva, Utah				$66.00 *C7*				3.65 *C7*	5.50 *C7*				
	Kansas City, Mo.								4.25 *S2*		4.10 *S2*			
	Los Angeles, Calif.				$85.00 *B2*	$90.00 *B2*			4.25 *B2, C7*	6.05 *B2*	4.25 *B2,C7*	6.40 *C1*	6.05 *B2*	
	Minnequa, Colo.								4.10 *C6*		4.55 *C6*			
	San Francisco, Cal.				$85.00 *B2*				4.20 *B2*	6.00 *B2*	4.25 *C7,B2*		6.05 *B2*	
	Seattle, Wash.	$73.00 *S11*			$85.00 *B2*				4.30 *B2*	6.10 *B2*	4.50 *B2*		6.30 *B2*	
SOUTH	Atlanta, Ga.										4.05 *A8*			
	Birmingham, Ala. Alabama City, Ala.			$56.00 *T2*	$66.00 *T2*				3.65 *R3,T2*	5.50 *T2*	3.50 *R3,T2*		5.30 *T2*	
	Houston, Texas		$62.00 *S2*		$74.00 *S2*	$78.00 *S2*			4.05 *S2*		3.90 *S2*			

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE	
Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Terne 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Coke* 1.25-lb. base box	Electro* 0.25-lb base box	Holloware Enameling 29 ga.	
													Bethlehem, Pa.
3.60 *B3*	4.35 *B3*				5.40 *B3*	6.55 *B3*			4.10 *W6*				Buffalo, N. Y.
										† Special coated mfg ternes deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb, deduct $2.20 from 1.25-lb coke base box. * COKES: 1.50-lb, add 25¢. ELECTRO: 0.50-lb, add 25¢; 0.75-lb, add 65¢.			Claymont, Del.
													Coatesville, Pa.
4.00 *A2*					5.65 *A2*								Conshohocken, Pa.
													Harrisburg, Pa.
													Hartford, Conn.
									4.10 *B3*				Johnstown, Pa.
													Newark, N. J.
													New Haven, Conn.
													Phoenixville, Pa.
													Putnam, Conn.
3.60 *B3*	4.35 *B3*	4.80 *B3*			5.40 *B3*	6.55 *B3*	6.75 *B3*		4.20 *B3*	$8.55 *B3*	$7.25 *B3*		Sparrows Pt., Md.
									4.40 *A5*				Worcester, Mass
									4.20 *R4*				Trenton, N. J.
									4.40 *L1*				Alton, Ill.
3.60 *A7*		4.80 *A7*	4.65 *A7*										Ashland, Ky.
		4.80 *R3*											Canton-Massillon
3.60 *W8*					5.40 *U1*				4.10 *A5,R3, N4*				Chicago, Ill.
3.60 *R3,J3*	4.35 *R3,J3*		4.65 *R3*		5.40 *R3,J3*	6.55 *R3,J3*			4.10 *A5*				Cleveland, Ohio
3.80 *G3* 4.40 *M3*	4.55 *G3*				5.95 *G3*	7.10 *G3*							Detroit, Mich.
													Duluth, Minn.
3.60 *U1, Y1,I3*	4.35 *U1, Y1,I3*	4.80 *U1,I3*	4.65 *U1,I3*	5.20 *U1*	5.40 *U1,I3* 5.90 *Y1*	6.55 *U1,I3* 7.05 *Y1*		5.40 *I3*	4.10 *Y1*	$8.45 *I3, U1, Y1*	$7.15 *U1,I3*	5.85 *U1* 5.30 *Y1*	Gary, Ind. Harbor, Indiana
4.30 *G2*	5.05 *G2*	5.50 *G2*	5.35 *G2*								$7.35 *G2*	6.05 *G2*	Granite City, Ill.
		5.20 *C9*											Kokomo, Ind.
	4.35 *A7*		4.65 *A7*	5.20 *A7*									Middletown, Ohio
5.25 *N3* 4.00 *S1*		6.00 *N3*		6.00 *N3*	5.40 *S1*								Niles, Ohio Sharon, Pa.
3.60 *U1, J3,A7* 3.75 *A3*	4.35 *U1, J3,A7*	4.80 *U1*	4.65 *U1*		5.40 *U1,J3*	6.55 *U1,J3*	7.20 *U1*		4.10 *A5* 4.30 *P6*	$8.45 *U1,J3*	$7.15 *U1,J3*	5.85 *U1*	Pittsburgh, Pa.
									4.30 *P7*				Portsmouth, Ohio
3.60 *W3,W5*	5.35 *F3* 4.35 *W3,W5*	4.80 *W3,W5*		5.20 *W3,W5*	5.75 *W3*	6.90 *W3*				$8.45 *W3,W5*	$7.15 *W3,W5*	6.15 *W5* 5.85 *F3*	Weirton, Wheeling, Follansbee, W. Va.
3.60 *U1, R3, Y1*	4.35 *R3, Y1*	5.50 *R1*	4.65 *Y1*	6.05 *E2*	5.40 *U1,R3* 5.90 *Y1*	6.55 *R3* 7.05 *Y1*		6.05 *R1,E2*	4.10 *Y1*	$8.45 *R3*	$7.15 *R3*		Youngstown, Ohio
4.55 *K1*	5.30 *K1*				6.35 *K1*	7.50 *K1*			4.90 *K1*				Fontana, Cal.
3.70 *C7*													Geneva, Utah
													Kansas City, Mo.
4.30 *C7*		5.55 *C7*						5.40 *C7*	4.90 *B2,C7*	$9.20 *C7*	$7.90 *C7*		Los Angeles, Cal.
									4.35 *C6*				Minnequa, Colo.
4.30 *C7*	5.30 *C7*	5.55 *C7*											San Francisco, Cal.
													Seattle, Wash.
													Atlanta, Ga.
3.60 *R3,T2*	4.35 *T2*	4.80 *R3,T2*			5.40 *T2*			4.75 *R3*	4.10 *R3,T2*	$8.55 *T2*	$7.25 *T2*		Birmingham, Ala. Alabama City, Ala.
									4.50 *S2*				Houston, Texas

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfg'rs. Bright
EAST	Bethlehem, Pa.				4.30 *B3*	5.40 *B3*	5.55 *B3*					
	Buffalo, N. Y.	3.70 *B3,R3*	3.70 *B3,R3*	4.60 *B5*	4.30 *B3,R3*	5.40 *B3*	5.55 *B3*	3.70 *B3*				4.85 *W6*
	Claymont, Del.							4.15 *C4*		4.85 *C4*		
	Coatesville, Pa.							4.15 *L4*		5.25 *L4*		
	Conshohocken, Pa.							4.15 *A2*	4.75 *A2*	5.05 *A2*	5.90 *A2*	
	Harrisburg, Pa.							6.30 *C3*	6.30 *C3*			
	Hartford, Conn.			5.10 *R3*		5.85 *R3*						
	Johnstown, Pa.	3.70 *B3*	3.70 *B3*		4.30 *B3*		5.55 *B3*	3.70 *B3*		4.75 *B3*	5.65 *B3*	4.85 *B3*
	Newark, N. J.			5.00 *W10*		5.75 *W10*						
	New Haven, Conn.											
	Phoenixville, Pa.											
	Putnam, Conn.			5.10 *W10*								
	Sparrows Point, Md.		3.70 *B3*					3.70 *B3*		4.75 *B3*	5.65 *B3*	4.95 *B3*
	Worcester, Mass.					5.75 *A5*						5.15 *A5,W6*
	Trenton, N. J.											
MIDDLE WEST	Alton, Ill.	4.15 *L1*										5.05 *L1*
	Ashland, Ky.							3.70 *A7*				
	Canton-Massillon	3.70 *R3*		4.55 *R3,R2*	3.95 *T5* 4.30 *R3*	4.90 *T5* 5.40 *R3,R2*						
	Chicago, Ill.	3.70 *U1, R3, W8*	3.70 *R3*	4.55 *A5,B5, W8,W1*	4.30 *U1,R3 W8*	5.40 *R3,W8 W10,B5,L2* 5.45 *A5*		3.70 *U1,W8*	4.75 *U1*	4.75 *U1*	5.65 *U1*	5.10 *W7* 4.85 *R3,A5, K2,N4*
	Cleveland, Ohio	3.70 *R3*	3.70 *R3*	4.55 *A5,C13*		5.45 *A5*	5.55 *R3,J3*	3.70 *R3,J3*	4.75 *J3*		5.65 *R3,J3*	4.85 *A5,C13*
	Detroit, Mich.	3.85 *R5*		4.70 *P8,R5* 4.80 *P3*	4.45 *R5* 4.65 *G3*	5.50 *R5* 5.55 *P8* 5.60 *P3*						
	Duluth, Minn.											4.85 *A5*
	Gary Ind. Harbor Indiana	3.70 *U1, Y1, I3*	3.70 *U1,I3, Y1*	4.55 *R3,M5, L2*	4.30 *U1,I3, Y1*	5.40 *R3,M5, L2*	5.55 *U1,I3* 6.05 *Y1*	3.70 *U1,I3, Y1*	4.75 *I3*	4.75 *U1*	5.65 *U1,I3* 6.15 *Y1*	5.10 *M4*
	Granite City, Ill.							4.40 *G2*				
	Kokomo, Ind.											4.95 *C9*
	Middletown, Ohio											
	Niles, Ohio Sharon, Pa.							3.95 *S1*		5.20 *S1*	5.70 *S1*	
	Pittsburgh, Pa.	3.70 *U1,J3*	3.70 *U1,J3*	4.55 *R3,A5, J3,S8,W10, C8*	4.30 *U1,C11*	5.40 *C11,S8, W10,C8,A5*	5.55 *U1,J3*	3.70 *U1,J3*	4.75 *U1*	4.75 *U1*	5.65 *U1,J3*	4.85 *A5,J3* 5.10 *P6*
	Portsmouth, Ohio											5.25 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	3.85 *W3*						4.00 *W3,W5*				
	Youngstown, Ohio	3.70 *U1,R3, Y1*	3.70 *U1,R3, Y1*	4.55 *Y1,F2*	4.30 *U1, Y1, C10*	5.40 *Y1,C10, F2*	5.55 *U1* 6.05 *Y1*	3.70 *U1,R3, Y1*			5.65 *R3* 6.15 *Y1*	4.85 *Y1*
WEST	Fontana, Cal.	4.40 *K1*	4.40 *K1*		5.35 *K1*		6.60 *K1*	4.30 *K1*		5.70 *K1*	6.25 *K1*	
	Geneva, Utah							3.70 *C7*			5.65 *C7*	
	Kansas City, Mo.	4.30 *S2*	4.30 *S2*		4.90 *S2*							5.45 *S2*
	Los Angeles, Cal.	4.40 *C7,B2*	4.40 *C7,B2*		5.35 *B2*		6.25 *B2*					5.80 *C7,B2*
	Minnequa, Colo.	4.15 *C6*	4.50 *C6*					4.50 *C6*				5.10 *C6*
	San Francisco, Cal.	4.45 *B2* 4.40 *C7*	4.45 *B2* 4.40 *C7*				6.30 *B2*					5.80 *C7*
	Seattle, Wash.	4.45 *B2*	4.45 *B2*				6.30 *B2*	4.60 *B2*			6.55 *B2*	
SOUTH	Atlanta, Ga.	4.25 *A8*	4.25 *A8*									5.10 *A8*
	Birmingham, Ala. Alabama City, Ala.	3.70 *R3,T2*	3.70 *R3,T2*				5.55 *T2*	3.70 *R3,T2*			5.65 *T2*	4.85 *R3,T2*
	Houston, Tex.	4.10 *S2*	4.10 *S2*		4.70 *S2*			4.10 *S2*				5.25 *S2*

Key to Steel Producers

With Principal Offices

Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin Inc., Harvey, Ill.

C1 California Cold Rolled Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Steel Corp., Claymont, Del.
C5 Cold Metal Products Co., Youngstown
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia-Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Glassport, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago

K1 Kaiser Corp., Oakland, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLauth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Co., Pittsburgh
N3 Niles Rolling Mills Co., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.

O1 Oliver Iron & Steel Co., Pittsburgh

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div. Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co. (John A.), Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sloss Sheffield Steel & Iron Co., Birmingham
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Sweet's Steel Co., Williamsport, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal, Iron & R. R. Co., Birmingham
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Steel Co., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.

U1 United States Steel Co., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Co., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wycoff Steel Co., Pittsburgh

Y1 Youngstown Sheet & Tube Co., Youngstown

Steel Prices

Base price, f.o.b., dollars per 100 lb.

WAREHOUSES		Sheets			Strip		Plates	Shapes	Bars		Alloy Bars			
Cities	Delivery Charge*	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4615 As rolled	Hot-Rolled A 4140 Annealed	Cold-Drawn A 4615 As Rolled	Cold-Drawn A 4140 Annealed
Baltimore	$.20	5.54–6.44	6.80–7.05	8.20	6.03	.....	6.13	6.13	6.01	6.63	.....	.....	.....	.....
Birmingham	.15	5.59	6.37	7.20–7.35[1]	5.54	.....	5.85	5.70	5.52	7.60	.....	.....	.....	.....
Boston	.20	6.25	7.03	8.33 8.59	6.15–6.20	7.74–8.70	6.38–6.63	6.20–6.25	6.05–6.14	6.61–6.92	10.25–10.30	10.55–10.63	11.95	12.15–12.28
Buffalo	.20	5.50–5.54	6.28–6.32	8.11–8.20	5.86	.....	5.89–5.98	5.80–5.82	5.52–5.55	6.18–6.45	10.15	10.45–10.52	11.80	12.10–12.17
Chicago	.20	5.54	6.32	7.70	5.49	.....	5.65–5.70	5.65	5.47	6.05–6.30	.....	10.10	.....	11.75
Cincinnati	.15	5.87	6.39	8.17	5.79	.....	6.17	6.12	5.77	6.66	.....	10.52	.....	12.22
Cleveland	.20	5.52–5.54	6.32	7.83 7.96	5.65 5.88	.....	5.82–5.83	5.95–6.16	5.54–5.61	6.15–6.40	.....	10.21	.....	11.86
Detroit	.20	5.73–5.74	6.49	8 19–8.34	5.78	.....	6.04–6.17	6.12	5.76	6.60	.....	10.37	.....	12.12
Houston	.20	6.35–6.58	7.37–8.09	8.57	6.15	.....	6.39–6.42	6.32–6.35	6.38	8.38–8.63	10.95	11.12–11.25	11.40	12.62–12.90
Indianapolis	del'd.	5.94	6.72	8.25	5.89	.....	6.10	6.05	5.87	6.80	.....	10.50	.....	.....
Kansas City	.20	6.22–6.40	7.64–7.68	8.66–8.70	6.10 6.90	7.81	6.38–6.74	6.43–6.48	6.20–6.77	7.01–7.22	10.00	10.10	11.50	11.80
Los Angeles	.20	6.30	8.10–8.45	9.30–9.35	6.40	10.45	6.30	6.30	6.25–6.35	8.15	11.30	11.30	13.05	13.50
Memphis	.10	6.25	7.03	7.51	6.20	.....	6.36	6.36–6.61	6.33–6.57	7.11	.....	.....	.....	.....
Milwaukee	.20	5.71	6.48	7.87	5.66	.....	5.81–5.87	5.82	5.64	6.31–6.61	.....	10.17	.....	.....
New Orleans	.15	5.98	7.01	8.26	5.93	.....	6.09	6.09	5.91	7.02	.....	.....	.....	.....
New York	.30	6.09–6.52	6.90–6.91	8.12–8.45	6.36–7.19	7.67	6.46–6.88	6.08–6.40	6.22–6.42	7.03–7.13	10.45	10.49–10.75	12.10	12.14–12.40
Norfolk	.20	6.68	.....	.....	6.33	.....	6.20	6.20	5.95	7.30	.....	.....	.....	.....
Philadelphia	.25	5.84–6.07	6.80–7.22	8.00 8.38	6.04–6.08	7.15	6.05–6.19	5.86–6.09	6.14–6.27	6.96–7.16	9.82–10.17	10.24–10.47	11.82	11.89–12.12
Pittsburgh	.20	5.54	6.32	7.85–8.10	5.59–5.84	.....	5.65–5.70	5.65	5.47	6.15–6.40	.....	10.10	.....	11.75
Portland	.20	7.25	8.64 9.00	9.10–9.25	7.30	.....	6.80	7.19	7.00	8.65	.....	.....	.....	.....
Salt Lake City	.20	7.95	.....	9.80–10.35	8.00	.....	7.45	7.60	7.95	.....	.....	.....	.....	.....
San Francisco	.15	6.51–6.65	7.88–8.23	9.10	6.42	10.45	6.40–6.43	6.30	6.32–6.34	8.15–8.20	11.30	11.30	13.05	13.50
Seattle	.20	6.14–6.81	8.38–8.44	8.93	7.05–7.75	.....	6.71–6.90	6.32–6.57	6.50–6.80	8.89–8.93	.....	.....	.....	.....
St. Louis	.20	5.73–5.84	6.62–7.15	8.00	5.77–5.79	7.66–8.15	6.02–6.10	6.05–6.22	5.77–5.80	6.43–6.70	10.08	10.40	11.73	12.05
St. Paul	.15	6.14	6.92	8.45	6.09	.....	6.25	6.25	6.07	6.75	.....	.....	.....	.....

* Metropolitan area delivery.

BASE QUANTITIES (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanizing sheets, for quantity.

EXCEPTIONS: (1) 500 to 1499 lb.

STAINLESS STEELS

Base price, cents per lb, f.o.b. mill.

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	14.25	15.25	16.75	16.25	24.75	20.00	21.75	12.75	14.75	13.00
Slabs, billets, rerolling	18.50	20.00	22.00	21.00	32.25	26.25	28.50	16.50	20.00	16.75
Forg. discs, die blocks, rings	34.00	34.25	36.75	35.75	53.00	40.25	44.75	28.00	28.50	28.50
Billets, forging	26.25	26.50	28.50	27.75	41.50	31.25	35.00	21.50	22.00	22.00
Bars, wires, structurals	31.25	31.50	34.00	33.00	49.25	37.00	41.50	25.75	26.25	26.25
Plates	33.00	33.25	35.25	35.25	52.00	40.75	45.25	27.00	27.50	27.50
Sheets	41.00	41.25	43.25	43.25	57.00	49.25	53.75	36.50	37.00	39.00
Strip, hot-rolled	26.50	28.25	32.50	30.25	48.75	37.00	41.25	23.50	30.25	24.00
Strip, cold-rolled	34.00	36.75	40.25	38.75	59.00	48.25	52.25	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS—*Sheets*: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; McKeesport, Pa., *U1*; Washington, Pa., *W2*; (type 316 add 4.5¢) *J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*; Lockport, N. Y., *R4*.

Strip: Midland, Pa., *C11*; Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; (type 316 add 4.5¢); W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Middletown, O., *A7*; Harrison, N. J., *D3*; Youngstown, *C5*; Lockport, N. Y., *S4*; Sharon, Pa., *S1* (type 301 add ¼¢); Butler, Pa., *A7*; Wallingford, Conn., *W1*.

Bars: Baltimore, *A7*; Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Lockport, N. Y., *S4*; Canton, O., *T5*; Ft. Wayne, *J4*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*.

Plates: Brackenridge, Pa., *A3* (type 416 add ¼¢); Butler, Pa., *A7*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Lockport, N. Y., *S4*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*.

Forged discs, die blocks, rings: Pittsburgh, *C11*; Syracuse, *C11*; Ferndale, Mich., *A3*; Washington, Pa., *J2*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*.

ALLEGHENY LUDLUM—Slightly higher on Type 301; slightly lower on others in 300 series.

WASHINGTON STEEL—Slightly lower on 300 series except where noted.

PIPE AND TUBING

Base discounts, f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS					
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½-3 In.		3½-4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
STANDARD T. & C.																				
Sparrows Pt. *B3*	34.0	12.0	37.0	16.0	39.0	19.5	40.0	20.0	40.5	21.0	41.0	21.5	41.5	22.0	....	....	....	....	....	....
Youngstown *R3*	36.0	14.0	39.0	18.0	41.5	21.5	42.9	22.0	42.5	23.0	43.0	23.5	43.5	24.0	....	....	....	....	....	....
Oakland *K1*	25.0	3.0	28.0	7.0	30.5	10.5	31.0	11.0	31.5	12.0	32.0	12.5	32.5	13.0	....	....	....	....	....	....
Pittsburgh *J3*	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.5	8.0	32.5	11.5	34.5	13.5
Pittsburgh *N2*	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
Alton, Ill. *L1*	35.0	13.0	38.0	17.0	40.5	20.5	41.0	21.0	41.5	22.0	42.0	22.5	42.5	23.0	....	....	....	....	....	....
Sharon *M3*	36.0	13.0	39.0	17.0	41.5	20.0	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.0	....	....	....	....	....	....
Pittsburgh *N1*	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	....	32.5	....	34.5	....
Wheeling *W5*	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	....	....	....	....	....	....
Wheatland *W4*	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	....	....	....	....	....	....
Youngstown *Y1*	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
Indiana Harbor *Y1*	35.0	13.0	38.0	17.0	40.5	20.5	41.0	21.0	41.5	22.0	42.0	22.5	42.5	23.0	....	....	....	....	....	....
EXTRA STRONG PLAIN ENDS																				
Sparrows Pt. *B3*	33.5	13.0	37.5	17.0	39.5	20.5	40.0	21.0	40.5	22.0	41.0	22.5	41.5	23.0	....	....	....	....	....	....
Youngstown *R3*	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	....	....	....	....	....	....
Oakland *K1*	24.5	4.0	28.5	8.0	30.5	11.5	31.0	12.0	31.5	13.0	32.0	13.5	32.5	14.0	....	....	....	....	....	....
Pittsburgh *J3*	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.0	7.5	33.0	12.0	36.5	15.5
Pittsburgh *N2*	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	10.0	33.0	14.0	36.5	17.5
Alton, Ill. *L1*	32.5	12.0	36.5	16.0	38.5	19.5	39.0	20.0	39.5	21.0	40.0	21.5	40.5	22.0	....	....	....	....	....	....
Sharon *M3*	35.5	14.0	39.5	18.0	41.5	21.0	42.0	21.5	42.5	22.0	43.0	22.5	43.5	23.0	....	....	....	....	....	....
Pittsburgh *N1*	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	....	33.0	....	36.5	....
Wheeling *W5*	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	....	....	....	....	....	....
Wheatland *W4*	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	....	....	....	....	....	....
Youngstown *Y1*	35.5	15.0	39.5	19.0	41.0	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	26.0	29.0	10.0	33.0	14.0	36.5	17.5
Indiana Harbor *Y1*	34.5	14.0	38.5	18.0	40.5	21.0	41.0	22.0	41.5	23.0	42.0	23.5	42.5	24.0	....	....	....	....	....	....

Galvanized discounts based on zinc, at 17¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢.

Threads only, buttweld and seamless, 1 pt. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 3½ pts. higher discount. Buttweld jobbers' discount, 5 pct. East St. Louis zinc price now 15.0¢.

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.50 to $15.00
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$17.50 to $18.00
Foundry, oven coke	
Buffalo, del'd	$26.58
Chicago, f.o.b.	23.00
Detroit, f.o.b.	24.00
New England, del'd	24.80
Seaboard, N. J., f.o.b.	22.75
Philadelphia, f.o.b.	22.70
Swedeland, Pa., f.o.b.	22.60
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	23.50
Cleveland, del'd	25.72
Cincinnati, del'd	25.06
St. Paul, f.o.b.	22.50
St. Louis	25.40
Birmingham, del'd	21.69
Neville Island	23.00

ELECTRICAL SHEETS

22 Ga. H-R cut length F.o.b. Mill Cents Per Lb.	Armature	Elec.	Meter	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beech Bottom *W5*	....	7.25	8.50	9.30	9.85	10.40	11.10
Brackenridge *A3*	....	7.25	8.50	9.30	9.85	....	....
Granite City *G2*	....	7.95	9.20	....	....	....	....
Ind. Harbor *I3*	6.75	7.25	....	....	....	....	....
Mansfield *E2*	7.25	7.75	9.00	9.80	....	....	....
Niles, O. *N3*	7.05	7.55	....	....	....	....	....
Vandergrift *U1*	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Warren, O. *R3*	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Zanesville *A7*	6.75	7.25	8.50	9.30	9.85	10.40	11.10

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Bl. Furnace Silvery	Low Phos. Charcoal
Bethlehem *B3*	54.00	54.50	55.00	55.50	....	....	....
Birmingham *R3*	48.38	48.88	....	....	....	....	....
Birmingham *W9*	48.38	48.88	....	....	....	....	....
Birmingham *S5*	48.38	48.88	....	....	....	....	....
Buffalo *R3*	52.00	52.50	53.00	....	....	....	....
Buffalo *H1*	52.00	52.50	53.00	....	....	63.75	....
Chicago *I4*	52.00	52.50	52.50	53.00	....	....	....
Cleveland *A5*	52.00	52.50	52.50	53.00	57.00	....	....
Cleveland *R3*	52.00	52.50	52.50	....	....	....	....
Daingerfield, Tex. *L3*	48.00	48.50	48.50	....	....	....	....
Duluth *I4*	52.00	52.50	52.50	53.00	....	....	....
Erie *I4*	52.00	52.50	52.50	53.00	....	....	....
Everett, Mass. *M6*	....	59.75	60.25	....	....	....	....
Fontana *K1*	58.00	58.50	....	....	....	....	....
Geneva, Utah *U1,Y1*	52.00	52.50	52.50	53.00	....	....	....
Granite City, Ill. *K3*	53.90	54.40	54.90	....	....	....	....
Hubbard, Ohio *Y1*	52.00	52.50	52.50	....	....	....	....
Ironton, Utah *C7*	52.00	52.50	....	....	....	....	....
Jackson, Ohio *J1,G1*	....	....	....	....	....	62.50	....
Lyle, Tenn. *T3*	....	....	....	....	....	....	66.00
Monessen *P6*	54.00	....	....	....	....	....	....
Neville Island *P4*	52.00	52.50	52.50	53.00	....	....	....
Pittsburgh *U1*	52.00	....	....	53.00	....	....	....
Sharpsville *S3*	52.00	52.50	52.50	53.00	....	....	....
Steelton *B3*	54.00	54.50	55.00	55.50	60.00	....	....
Swedeland *A2*	56.00	56.50	57.00	57.50	....	....	....
Toledo *I4*	52.00	52.50	52.50	53.00	....	....	....
Troy, N. Y. *R3*	54.00	54.50	55.00	....	60.00	....	....
Youngstown *Y1*	52.00	52.50	52.50	53.00	....	....	....
N. Tonawanda, N. Y. *T1*	....	52.50	53.00	....	....	....	....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base, (1.75 to 2.25 pct, except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 35¢ per ton for phosphorus, content 0.70 pct and over. Silvery Iron: Add $1.50 per net ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. $1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	22.67	26.66	21.99	25.86
	2½	12	30.48	35.84	29.57	34.76
	3	12	33.90	39.90	32.89	38.70
	3½	11	42.37	49.89	41.10	48.39
	4	10	52.60	61.88	51.03	60.02
National Tube	2	13	21.62	26.48	....	....
	2½	12	29.65	36.32	....	....
	3	12	34.00	41.64	....	....
	3½	11	40.34	49.41	....	....
	4	10	51.21	62.72	....	....
Pittsburgh Steel	2	13	....	27.08	....	....
	2½	12	30.49	37.15	....	....
	3	12	34.95	42.50	....	....
	3½	11	41.48	50.54	....	....
	4	10	52.65	64.16	....	....

CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	$105.30 to $108.80
6 to 24-in., del'd N.Y.	108.50 to 109.50
6 to 24-in., Birmingham	91.50 to 96.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipment less	$123.00 to $130.00

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

C-R SPRING STEEL

Cents Per Lb. F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Bridgeport, Conn. *S7*	5.35	6.80	7.40	9.35	11.65
Carnegie, Pa. *S9*	....	6.80	7.40	9.35	11.65
Cleveland *A5*	4.65	6.45	7.40	9.35	11.65
Detroit *D1*	5.60	6.65	7.25	....	....
New Castle, Pa. *B4*	5.35	6.80	7.40	9.35	....
New Haven, Conn. *D1*	5.85	6.75	7.35	....	....
Sharon, Pa. *S1*	5.35	6.80	7.40	9.35	11.65
Weirton, W. Va. *W3*	5.35	6.80	7.40	9.35	11.65
Worcester, Mass. *A5*	4.95	6.75	7.70	9.65	11.95
Youngstown *C5*	....	6.80	7.40	9.35	11.65

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Base Col.	Woven Wire Fence 9-15½ ga. Base Col.	Fence Posts Base Col.	Single Loop Bale Ties Base Col.	Twisted Barbless Wire Base Col.	Galv. Barbed Wire Base Col.	Merch. Wire Annld ¢/lb.	Merch. Wire Galv.* ¢/lb.
Alabama City *R3*	118	126	....	123	....	136	5.70	5.95
Aliquippa, Pa. *J3*	118	132	....	....	136	140	5.70	6.15
Atlanta *A8*	121	133	....	126	126	143	5.95	6.40
Bartonville *K2*	118	130	....	123	143	143	5.70	6.15
Buffalo *W6*	....	....	....	....	....	....	4.85	....
Cleveland *A6*	125	....	....	....	....	....	....	....
Cleveland *A5*	....	....	....	....	....	....	5.70	6.10
Crawfrdsvl. *M4*	....	132	....	....	....	145	5.95	6.40
Donora, Pa. *A5*	118	130	....	123	140	140	5.70	6.15
Duluth *A5*	118	130	....	123	140	140	5.70	6.15
Fairfield, Ala. *T2*	118	130	....	123	....	140	5.70	6.15
Houston *S2*	126	138	....	....	....	148	6.10	6.55
Johnstn., Pa. *B3*	118	130	....	....	140	....	5.70	6.15
Joliet, Ill. *A5*	118	130	....	123	....	140	5.70	6.15
Kokomo, Ind. *C9*	120	132	....	125	138	142	5.80	6.05
Los Angeles *B2*	....	....	....	....	....	....	6.65	....
Kansas City *S2*	130	....	....	135	....	152	6.30	6.75
Minnequa *C6*	123	138	130	128	146	146	5.95	6.45
Monessen *P6*	124	135	....	....	....	145	5.95	6.40
Moline, Ill. *R3*	....	....	136	....	....	....	....	....
Pittsburg, Cal. *C7*	137	....	....	147	156	160	6.65	6.80
Portsmouth *P7*	124	137	....	....	147	147	6.10	6.60
Rankin, Pa. *A5*	118	130	....	....	140	140	5.70	6.15
So. Chicago *R3*	118	126	140	123	....	136	5.70	5.95
S. San Fran, *C6*	....	....	....	147	....	160	6.65	7.10
Sparrows Pt. *B3*	120	....	....	125	142	142	5.80	6.25
Sterling, Ill. *N4*	118	130	....	123	140	140	5.70	6.15
Struthers, O. *Y1*	....	....	....	....	....	....	5.70	6.15
Torrance, Cal. *C7*	138	....	....	....	....	....	6.65	....
Worcester *A5*	124	....	....	....	....	....	6.00	6.45
Williamsport, Pa. *S10*	....	....	150	....	....	....	....	....

Cut Nails, carloads, base $7.35 per 100 lb. (less 20¢ to jobbers), at Conshohocken, Pa., (*A2*), Wheeling, W. Va. (*W5*), $7.15.

* Alabama City and So. Chicago don't include zinc extra

". . . free as a nation and financially independent as individuals."

OLIVER P. ECHOLS

Chairman of the Board, Northrop Aircraft, Inc.

"For nearly every American, systematic saving during productive years is the best means of insuring future security. We at Northrop Aircraft believe in the Payroll Savings Plan. We feel that bond purchases contribute greatly toward keeping us free as a nation and financially independent as individuals."

In addition to a deep, personal interest in his own company's Payroll Savings Plan, Mr. Echols is Chairman of the Aircraft Industry Committee to build employee participation in the Payroll Savings Plan.

- When Mr. Echols' Committee was formed, 17 major airframe manufacturers and 11 major suppliers, employing 400,000 workers, had a total of 80,000 employees enrolled in the Payroll Savings Plan.
- At Mr. Echols' request all 28 companies agreed to conduct person-to-person canvasses among their employees.
- The first companies to complete their canvasses report a total of more than 70,000 new Payroll Savers bringing the industry total to more than 150,000 participants.
- In the first reports on campaigns, average payroll participation (companies reporting) went from 20% to 32%. Latest indications are that the average participation—all 28 companies—will be well over 50% by the time the canvasses are completed.
- It is estimated that the 70,000 new Payroll Savers already added to the Plan through the co-operation of Mr. Echols and his Committee will purchase more than 15 million dollars worth of Series E Defense Bonds during the next twelve months.

Has *every* employee of your company been offered an opportunity to enroll in the Payroll Savings Plan? If not, phone, wire or write to Savings Bond Division, U. S. Treasury Department, Suite 700, Washington Building, D. C. Your State Director will help you conduct a person-to-person canvass.

Typical Companies Reporting Results of Person-to-Person Canvasses, Payroll Savings Plan.

	Before Canvass	After Canvass
Hughes Aircraft	38.7%	85.8%
Continental Motors	10%	70%
Boeing Aircraft	17.8%	55.1%
Rohr Aircraft	1.3%	77.6%
Solar Aircraft	1.8%	60.5%
Bell Aircraft	14%	50%

The U.S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

The Iron Age

—Miscellaneous Prices—

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Axles	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	3.60	4.00	4.70	....	....	....	....	....
Chicago *R3*	....	....	....	6.15	....	....	....	....
Cleveland *R3*	....	....	....	....	....	9.35	....	....
Ensley *T2*	3.60	4.00	....	....	....	....	....	....
Fairfield *T2*	....	4.00	4.70	6.15	5.60	....	4.50	9.10
Gary *U1*	3.60	4.00	....	....	....	....	4.50	....
Ind. Harbor *I3*	3.60	....	4.70	6.15	5.60	....	4.50	....
Johnstown *B3*	....	4.00	....	....	5.60	....	....	....
Joliet *U1*	....	4.00	4.70	....	....	....	....	....
Kansas City *S2*	....	....	....	6.40	....	....	....	9.85
Lackawanna *B3*	3.60	4.00	4.70	....	....	....	4.50	....
Lebanon *B3*	....	....	....	6.15	....	9.35	....	9.85
Minnequa *C6*	3.60	4.50	4.70	6.15	....	....	4.50	9.85
Pittsburgh *R3*	....	....	....	....	....	9.35	....	....
Pittsburgh *O1*	....	....	....	....	....	9.35	....	9.85
Pittsburgh *P5*	....	....	....	....	....	....	....	9.85
Pittsburgh *J3*	....	....	....	6.15	....	....	....	....
Pitt'g., Cal. *C7*	....	....	....	....	....	....	4.65	....
Seattle *B2*	....	....	....	6.65	....	....	4.65	....
Steelton *B3*	3.60	....	4.70	....	....	....	4.50	....
Struthers *Y1*	....	....	....	6.15	....	....	....	....
Torrance *C7*	....	....	....	....	....	....	4.65	....
Youngstown *R3*	....	....	....	6.15	....	....	....	....

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.505
18	4	1	—	5	$2.13
18	4	2	—	—	$1.65
1.5	4	1.5	8	—	81.0¢
6	4	2	6	—	96.5¢

High-carbon chromium ..... 63.5¢
Oil hardened manganese ..... 35¢
Special carbon ..... 32.5¢
Extra carbon ..... 27¢
Regular carbon ..... 23¢

Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

CLAD STEEL

	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct.		
Coatesville, Pa. *L4*	*29.5	
Washington, Pa. *J2*	*29.5	
Claymont, Del. *C4*	*28.00	
Conshohocken, Pa. *A2*		*27.50
New Castle, Ind. *I2*	*29.27	*26.24
Nickel-carbon		
10 pct Coatesville, Pa. *L4*	32.5	
Inconel-carbon		
10 pct Coatesville, Pa. *L4*	40.5	
Monel-carbon		
10 pct Coatesville, Pa. *L4*	33.5	
No. 302 Stainless-copper stainless, Carnegie, Pa. *A4*		77.00
Aluminized steel sheets, hot dip, Butler, Pa. *A7*		7.75

* Includes annealing and pickling, or sandblasting.

ELECTRODES

Cents per lb, f.o.b., plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
	GRAPHITE	
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	22.61
2½	24, 30	23.15
2	24, 30	25.36
	CARBON	
40	100, 110	8.03
35	65, 110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
20	84, 90	8.03
17	60, 72	8.57
14	60, 72	8.84
10, 12	60	9.10
8	60	

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill.
Price, net ton; Effective CaF_2 content:
70% or more $43.00
60% or less 40.00

—Miscellaneous Prices—

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Nuts, Hot Pressed, Cold Punched—Sq.

	Pct Off List			
	Less Keg.	K.	Less Keg.	K.
	Reg.		Hvy.	
½ in. & smaller	15	28½	15	28½
9/16 in. & ⅝ in.	12	25	6½	21
¾ in. to 1½ in. inclusive	9	23	1	16½
1⅝ in. & larger	7½	22	1	16½

Nuts, Hot Pressed—Hexagon

½ in. & smaller	26	37	22	34
9/16 in. & ⅝ in.	16½	29½	6½	21
¾ in. to 1½ in. inclusive	12	25	2	17½
1⅝ in. & larger	8½	23	2	17½

Nuts, Cold Punched—Hexagon

½ in. & smaller	26	37	22	34
9/16 in. & ⅝ in.	23	35	17½	30½
¾ in. to 1½ in. inclusive	19½	31½	12	25
1⅝ in. & larger	8½	23	2	17½

Nuts, Semi-Finished—Hexagon

	Reg.		Hvy.	
½ in. & smaller	35	45	28½	29½
9/16 in. & ⅝ in.	23	35	17½	30½
¾ in. to 1½ in. inclusive	24	36	15	28½
1⅝ in. & larger	13	26	8½	23
	Light			
7/16 in. & smaller	35	45		
½ in. thus ⅝ in.	28½	39½		
¾ in. to 1½ in. inclusive	26	37		

Stove Bolts *Pct Off List*

Packaged, steel, plain finished. 48—10
Packaged, plate finish ..... 31—10
Bulk, plain finish** 62*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets *Base per 100 lb*

½ in. & larger $7.85

Cap and Set Screws

(In bulk)	*Pct Off List*
Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	54
¾ in. thru 1 in. up to & including 6 in.	48
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat	46
¾ in. thru 1 in. up to & including 6 in.	41
Milled studs	35
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	34
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	53

Machine and Carriage Bolts

	Pct Off List Less Case	C.
⅛ in. & smaller x 6 in. & shorter	15	28½
9/16 in. & ⅝ in. x 6 in. & shorter	18½	30½
¾ in. & larger x 6 in. & shorter	17½	29½
All diam. longer than 6 in.	14	27½
Lag, all diam. x 6 in. & shorter	23	35
Lag, all diam. longer than 6 in.	21	33
Plow bolts	34	....

—Miscellaneous Prices—

REFRACTORIES

Fire Clay Brick

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5)	$94.60
No. 1 Ohio	$8.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	88.00
No. 2 Ohio	79.20
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	13.75

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$94.60
Childs, Pa.	99.00
Hays, Pa.	100.10
Chicago District	104.50
Western Utah and Calif.	111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago	111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	16.50
Silica cement, net ton, bulk, Hays, Pa.	18.70
Silica cement, net ton, bulk, Ensley, Ala.	17.60
Silica cement, net ton, bulk, Chicago District	17.60
Silica cement, net ton, bulk, Utah and Calif.	24.70

Chrome Brick *Per Net Ton*

Standard chemically bonded Balt, Chester	$82.00

Magnesite Brick

Standard, Baltimore	$104.00
Chemically bonded, Baltimore	93.00

Grain Magnesite *St. ⅜-in. grains*

Domestic, f.o.b. Baltimore in bulk fines removed	$62.70
Domestic, f.o.b. Chewalah, Wash., in bulk	36.30
in sacks	41.80

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢	$13.75

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. 1952 prices not yet established. 1951 prices were:

Old range, bessemer	$8.70
Old range, nonbessemer	8.55
Mesabi, bessemer	8.45
Mesabi, nonbessemer	8.30
High phosphorus	8.30

After adjustments for analyses, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in Lake vessel rates, upper Lake rail freights, dock handling charges and taxes thereon.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	7.4¢ to 9.0¢
Canadian sponge iron, del'd, in East	10.00¢
Domestic sponge iron, 98+% Fe, carload lots	15.5¢ to 17.0¢
Electrolytic iron, annealed, 99.5+% Fe	42.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	53.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe	83.0¢ to $1.48
Aluminum	31.5¢
Brass, 10 ton lots	30.00¢ to 33.25¢
Copper, electrolytic	10.75¢ plus metal value
Copper, reduced	10.00¢ plus metal value
Cadmium, 100-199 lb	95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity, del'd	$3.50
Lead	7.5¢ to 12.0¢ plus metal value
Manganese	57.0¢
Molybdenum, 99%	$2.75
Nickel, unannealed	88.0¢
Nickel, annealed	95.0¢
Nickel, spherical, unannealed	92.0¢
Silicon	38.5¢
Solder powder	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	83.00¢
Stainless steel, 316	$1.10
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$6.00
Zinc, 10 ton lots	23.0¢ to 30.5¢

Ferroalloy Prices

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk in carloads delivered. (65-72% Cr, 2% max. Si.)

0.06% C	30.50	0.20% C	29.50
0.10% C	30.00	0.50% C	29.25
0.15% C	29.75	1.00% C	29.00
2.00% C			28.75
65-69% Cr, 4-9% C			22.00
62-66% Cr, 4-6% C, 6-9% Si			22.60

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.14
0.50% max. C	1.10
9 to 11% C	1.08

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.

Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

CMSZ

Contract price, cents per lb of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	20.75
Less ton lots	22.00

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50
Less ton lots	17.75

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.00
Ton lots to carload packed	19.00
Less ton lots	20.50

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size.

F.o.b. Niagara Falls, Alloy, W. Va., Ashtabula, O.	$185
F.o.b. Johnstown, Pa.	$187
F.o.b. Sheridan, Pa.	$185
F.o.b. Etna, Clairton, Pa.	$188

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.95
Ton lots	12.55

Ferroalloys

Continued

Spiegeleisen

Contract prices gross ton; lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$74.00	$75.00
Pbh. or Chicago	74.00	75.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	34.75
Ton lots	36.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.7% max. C, 0.06% P, 90% Mn	26.25	28.10	29.30
0.07% max. C	25.75	27.60	28.80
0.15% max. C	25.25	27.10	28.30
0.30% max. C	24.75	26.60	27.80
0.50% max. C	24.25	26.10	27.30
0.75% max. C 7.00% max. Si	21.25	23.10	24.30

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.

Carloads	9.90
Ton lots	11.30

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.15

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 19.15¢

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	9.90
Ton lots	11.55
Briquet, contract basis carlots, bulk delivered, per lb of briquet	11.15
Ton lots	12.75

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $92.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $90.00. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	21.70
97% Si, 1% Fe	22.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90.95% Si			17.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Other Ferroalloys

Ferrocolumbium, 50-60% 2 in. x D, contract basis, delivered, per pound contained Cb.
Ton lots $4.90
Less ton lots 4.95

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $3.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo. $1.32

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
10 tons to less carload $75.00

Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots 1.55

Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $177.00

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W5, ton lots, delivered $5.00

Ferrovanadium, 35-55% contract basis, delivered, per pound, contained V.
Openhearth ..... $3.00-$3.10
Crucible 3.10- 3.20
High speed steel (Primos) 3.20- 3.25

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
Carload, bulk lump ..... 14.50¢
Ton lots, bulk lump ..... 15.75¢
Less ton lots, lump ..... 16.25¢

Vanadium Pentoxide, 86-89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.28

Zirconium, 35-40%, contract basis f.o.b. plant, freight allowed, per pound of alloy.
Ton lots ..... 21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
Carload, bulk ..... 7.00¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B.... $5.25

Bortam, f.o.b. Niagara Falls
Ton lots, per pound ..... 45¢
Les ton lots, per pound.... 50¢

Corbortam, Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.
Ton lots, per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots.... $1.20
F.o.b. Wash., Pa.; 100 lb up
10 to 14% B ..... .85
14 to 19% B 1.20
19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.
No. 1 ..... $1.00
No. 6 ..... 68¢
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
Ton lots $1.46
Less ton lots 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.
Less ton lots $1.80

Silcaz, contract basis, delivered.
Ton lots ..... 45.00¢

The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Phase Out Fade-Out—Stretching out of government defense programs is having an adverse effect on large machine tool rebuilders. Dealer's one-time formidable backlogs are steadily being eaten away. There is little hope of a return to the 1951 pace, barring a speed-up in the arms program resulting from an all-out war.

An example of this condition is the Euclid plant of the Motch & Merryweather Machinery Co., Cleveland. The plant is about 4 years old; cost around $2 million, including facilities, and is the center of the firm's used machinery trade. Prior to the Korean conflict its main business was buying and rehabilitating used machinery for resale on the open market.

Depleted Stocks — The hectic buying spree following Korea rapidly depleted the firm's stocks of completed machine tools. Nearly 400 units were sold in a brief 6-month period. Faced with an increasing scarcity of machine tools, skyrocketing prices, and later with the tight profit margins imposed by price ceilings, the firm switched more and more of its facilities to the rehabilitation of government machine tools on lease to prime contractors.

The first government contract came from Pratt & Whitney in the fall of 1950. Since then between 70 and 80 units embracing eight different machine tool classifications, including radial drills, lathes, milling machines and jig borers, have been rehabilitated for this one customer.

Other prime contractors followed suit. Soon Motch & Merryweather was rebuilding government-owned machine tools for Wright Aeronautical Corp., Jack & Heintz Precision Industries, Lempco Products, Cleveland Graphite Bronze and numerous others holding defense orders.

Hit Stride—During the second quarter of 1951, with more and more machine tools being released from government reserve pools, the program went into full swing. The company rebuilt nearly 400 units during the calendar year.

Motch & Merryweather was primarily interested in machines made after 1938—since these units were best suited to the plant's facilities and were the most desired by government contractors.

Price is Right—Savings resulting from rebuilding machine tools is clearly shown in the case of ten Bullard multimatics the company rebuilt for Wright Aeronautical. Aside from great savings in time, replacement of these machines would have cost $600,000 to $750,000. Motch & Merryweather was able to rebuild them, including installation of a considerable amount of new tooling, at roughly 15 pct of the manufacturer's price.

At present Motch & Merryweather is rebuilding about 30 medium-sized tools per month. Production schedules are continuing at a high rate, but order backlogs are thinning.

Orders now on hand will carry production through August. The future after that is uncertain. Unless more contracts are given out and more tools are available for rebuilding, production will fall off markedly. The firm will be faced with the problem of once again securing both used machinery and buyers on the open market.

New Members—One of the Machinery Dealers National Assn.'s long-time objectives has been fulfilled with the official formation of a new chapter in Pittsburgh. Composing the new group are: Brandt Machinery Co., Duquesne Electric & Manufacturing Co., Hale Machinery Co., Kruman Equipment Co., McBeth Machinery Co. and Homestead Electric & Machine Co. In addition, six more used machinery Companies have expressed an interest in joining the new chapter.